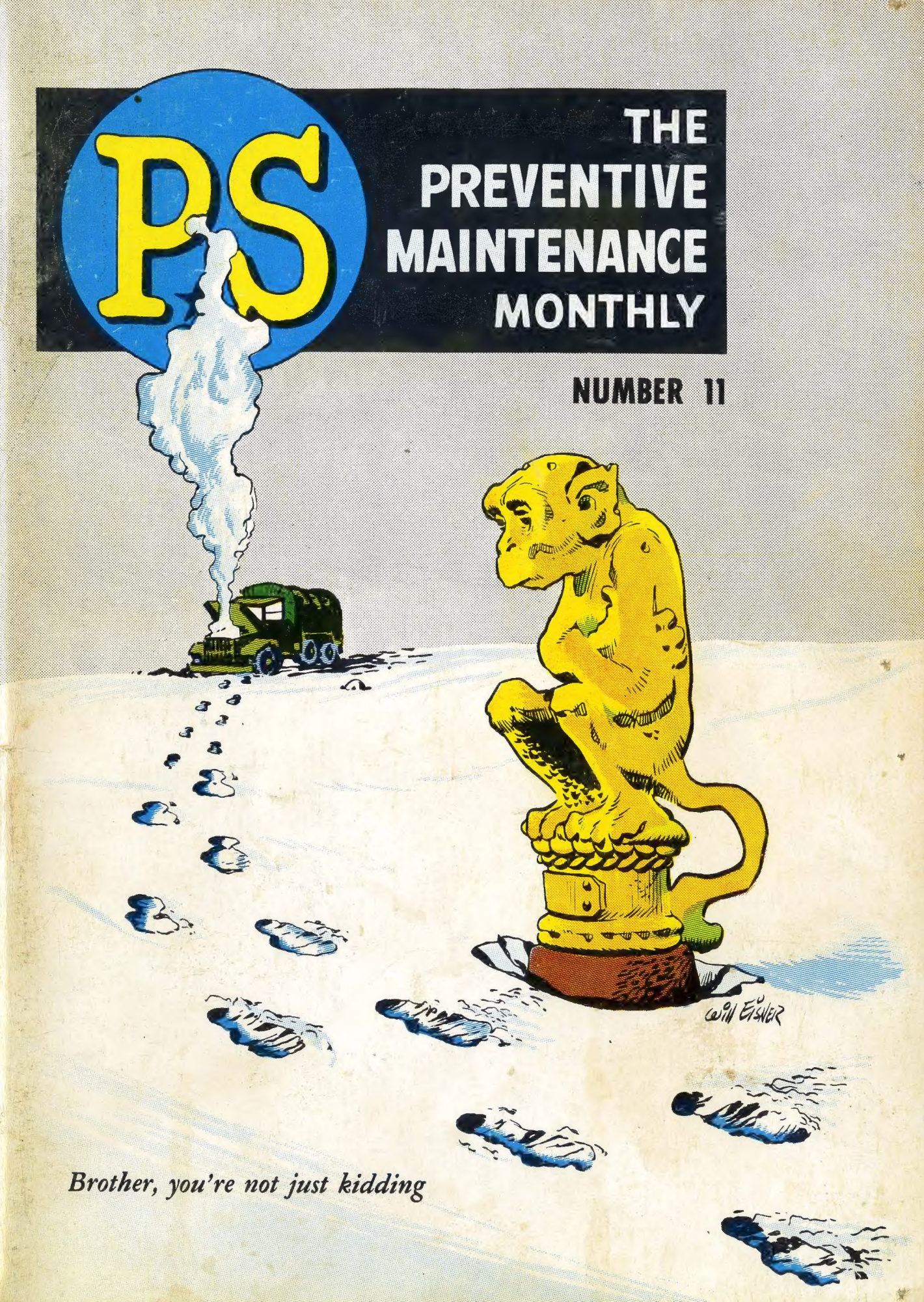
PS

THE PREVENTIVE MAINTENANCE MONTHLY

NUMBER 11

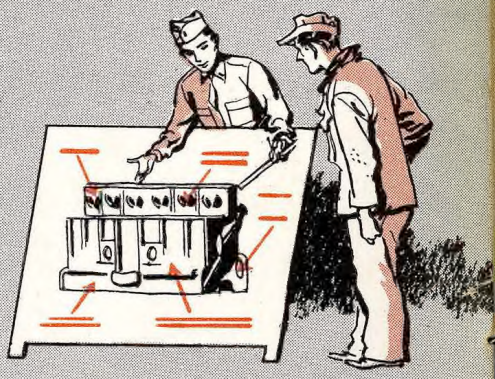


Brother, you're not just kidding

ALL TRAINING IS FOR *COMBAT*

Ever hear of a joe named Aristotle?
Aristotle was a famous man in his day
and is remembered even now as the gentleman who invented
a highly effective weapon
called a syllogism.
It wasn't the kind of weapon you'd find in today's armies,
and as a matter of fact,
you probably wouldn't get very far up Triangle Hill
if it was all you had to fight with.
A syllogism is a weapon of argument—
a sort of verbal arithmetic that goes something like this:
Armies are kept handy in case of a fight.
The soldiers have to be ready whenever the fight starts.
To be ready, the soldiers have to be trained.
Now, since their only reason for being soldiers
is to be ready for combat,
then all their training should be for combat.
Get the point?
Back in Aristotle's day,
a man and his spear was a fully equipped soldier,
ready for a fight.
Since a few new things have been added,
it takes a little longer to get ready.
Are you ready?
Is your equipment ready?
Would you stake your life on it?

TRAINING IS



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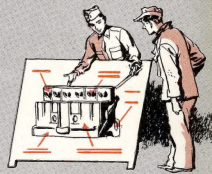

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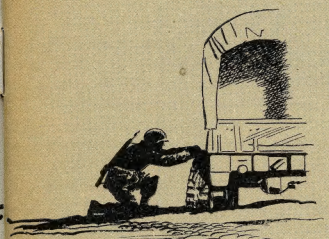

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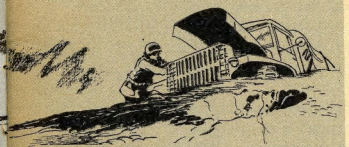

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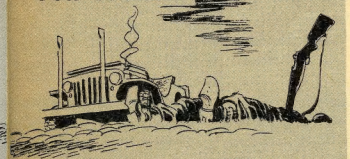

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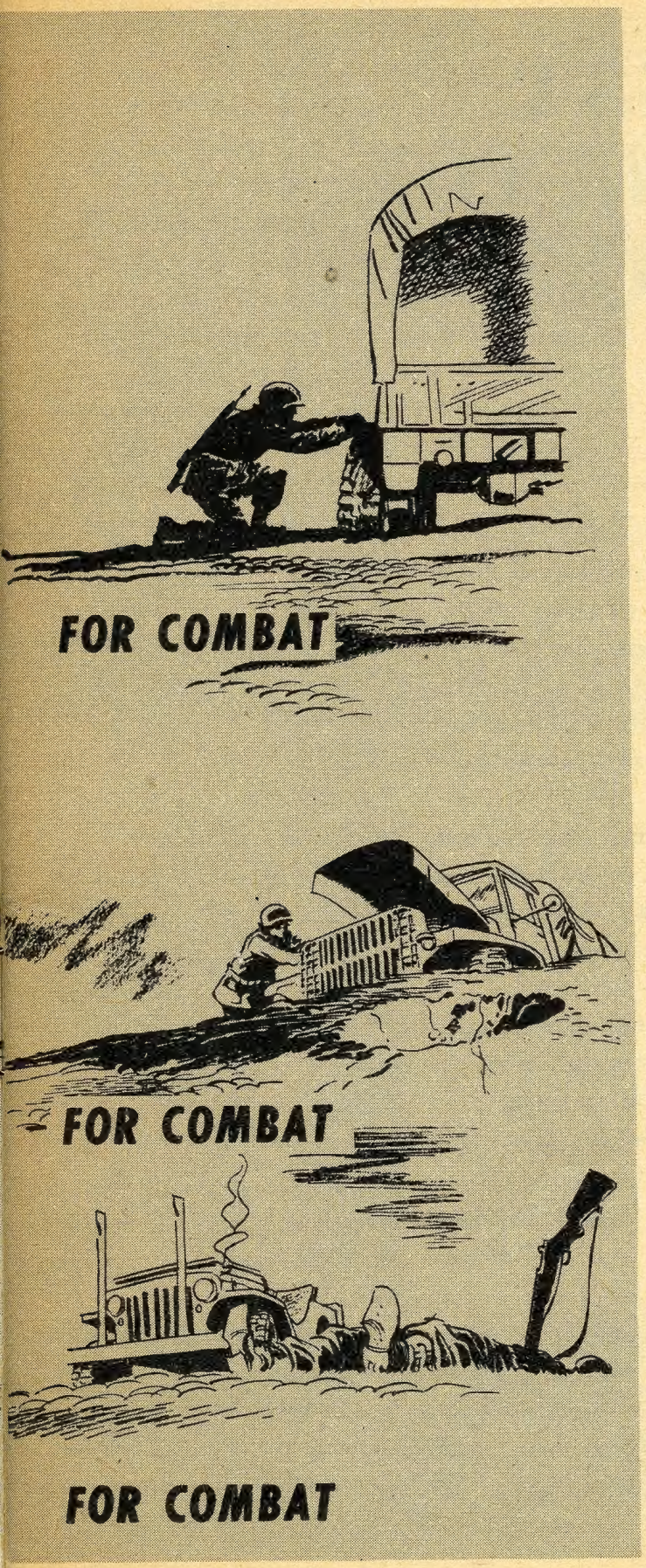

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COMBAT MAINTENANCE STORIES

DON'T JUST ASK FOR IT —CHECK THE AMMO

Dear Editor,

In the firing section of the 105-Howitzer battery we make it standard practice to check each round of ammunition to see if all the firing charges are there. It pays. One unit had to learn the hard way, but it taught us all a good lesson when some of their rounds fell a couple-thousand yards short—and you know what.

Wasn't long before we also caught some rounds that had got into the area for the old "airborne" M3-Howitzer. It's the same as we were using in every other way, except the complete round has only five charges.

It pays to watch the markings on the packages and look again at the ammunition itself. If we'd fired that stuff without looking at it first, "short" would be hardly the word for what we'd have caught for it.

Lt Glenn Turner
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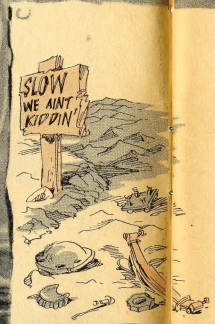

DUAL TIRES VERSUS SINGLE

Dear Editor,

Glad to hear the Army is going back to dual tires in the XM211 and XM35. Recalls to mind the time our "mobile" motor pool got orders to evacuate the area—pronto.

A good many of our vehicles were deadlined waiting for tires to come thru, but lucky for us we were operating with World War II trucks with dual tires.

We made it alright (and didn't lose a vehicle) by taking the outside wheels off the duals and sharing them with the trucks that were deadlined. Loading had to be done a little different—heavy on the trucks that still had all their wheels and light on those that didn't.

Know this isn't the way the books says to do it, but in an emergency . . .

Lt Daniel E. Ware
Korea

BETTER BELIEVE IN SIGNS

Dear Editor,

We'd been having a lot of trouble with the springs breaking on the 4-ton Diamond T's that had been issued to us as prime mover and ammunition trucks. We soon realized that an MP sign reading 20-mph isn't just kidding, nor is the sign put there merely for the purpose of passin' out DR's.

Even with careful driving, a heavily loaded truck jouncing over those washboards gives the springs an awful beating. And in the long run, you lose twice the time you tried to make on the road.

We soon learned to believe in signs—road signs that is. We not only had fewer broken springs, but the equipment (drivers included) was holding up better.

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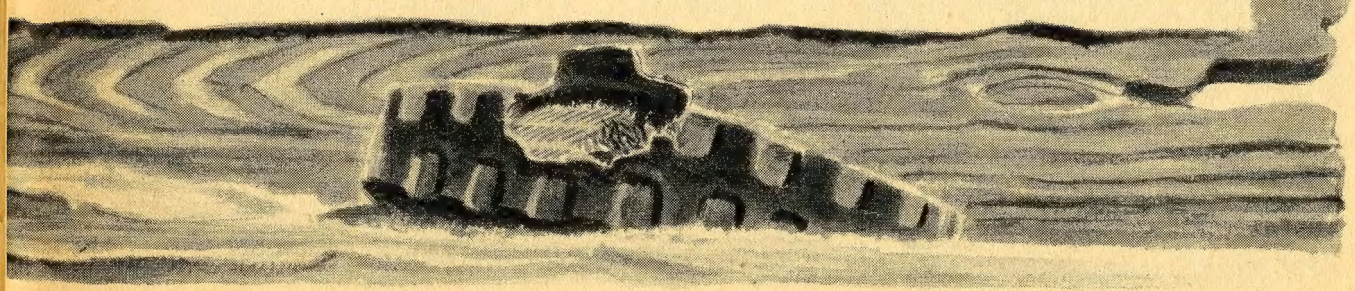


WHEELS IN THE MUD

Dear Editor,

Guess a lot of guys here in Korea didn't get a chance to read that story in PS #7 which said to keep mud off the wheels and brakes of their M155-howitzers, because the same thing goes for 1-ton trailers.

On convoy the wheels on our 1-ton trailers were locking. The mud was coming up into our brake drums and some of the men had let the trailers go without getting out the mud. Next time out, their wheels wouldn't move at all. It only takes a few minutes to remove the wheel and get the mud out while it's still wet. It's also handy to have your wheels ready to move.

Edward Reed
Korea

TOO COMFORTABLE

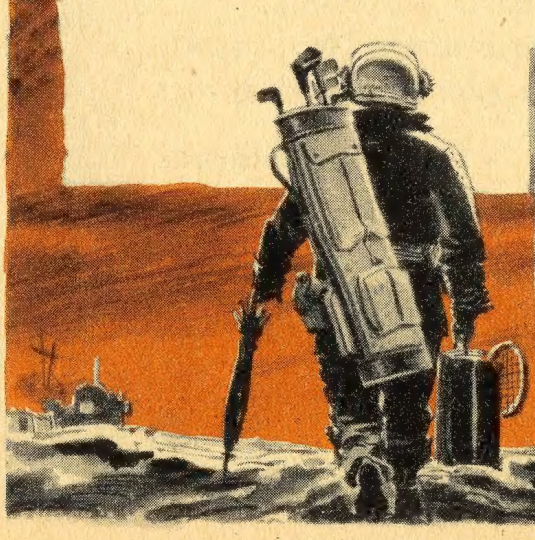
Dear Editor,

I just came away from a bull session where some guys were griping about not having the comforts other guys have. Well, sometimes, you're better off without the comforts.

Not long ago a buddy of mine fell asleep driving a vehicle with a personnel heater in it. He's in the hospital now. Heaters have been removed from all vehicles in the company because too many men fall asleep while driving.

Another thing, while doors and stuff on cabs are comfortable, most men take theirs off even in cold weather. No matter where you're driving on this Pacific rock, you might need to tumble the hell out and into the nearest ditch.

PFC Larry Singer
Korea



(Ed Note—Taking out heaters solves nothing. With better maintenance discipline you guys wouldn't dare use those heaters unless you were about to freeze, which is what they're for.)

GAA vs OLD LUBES

HALF-MAST HAD A LETTER THE OTHER DAY THAT SAID:

....And what's the scoop on this new so-called all-purpose grease (Grease, Automotive and Artillery) that's supposed to replace almost everything else?

Our experience is that it won't work as a wheel bearing grease. It practically turns to water. What's the score? We're also interested in knowing whether GAA can be mixed with the below-listed lubricants (Reference TB 9-2835-13, 17 July 52).

1. General Purpose Lubricating Grease No. 2 (WB) (QMC Issue) no
2. General Purpose Lubricating Grease No. 1 (CG-1) (Automotive and Industrial Lubricating Grease) (QMC Issue) no
3. General Purpose Lubricating Grease No. 0 (CG-0) (QMC Issue) yes
4. Ordnance Corps Lubricating Grease No. 0 (OG-0) (QMC Issue) no
5. Ordnance Corps Lubricating Grease No. 00 (OG-00) (QMC Issue) yes

The above information is requested as a guide for both arsenal and field maintenance.

Capt A. R. N.

HALF-MAST'S REPLY TO CAPT A. R. N. WENT SOMETHING LIKE THIS:

A lot of people have complained that GAA runs in wheel bearings regardless of the precautions taken. And they tell me they're experimenting as they go along to find GAA top capabilities.

With it all as it is at the moment, nobody being sure what grease is where or exactly what it's best used for under what conditions and in what climates, which time of the year, the best pitch PS knows to give you is this: Before you go to a whole lot of trouble cleaning and repacking one thing with another, make sure that what you've already got in lube points is not what you need, and make sure that what you plan to put in its place will do the job better. Only way to find out is to get a reading from your Division Ordnance Officer by telling him the maker's name and the contract number on the cans of lube you're loading in your guns.

For instance, they'd do well to paint this on all GAA cans: GAA won't mix with soda-base greases.

They could also try this lube job per instructions in TB 9-2835-12, 9 July 52—use only the very best grease seals and avoid as nearly as possible leakage of gear oil into the GAA-packed bearings.

The only exception to this wheel-bearing lubing plan is the wheel and bogie bearings of vehicles en route to FECOM. They get WB No. 2 instead of the new lube, per latest instructions to the field from the Chief of Ordnance (TT-33314, 13 Nov 52).

GAA mixes with calcium (lime-base) greases under all conditions, and as PS #9 said, all greases MIL-G-10924 (ORD) are mixable regardless of their respective color.

Notes On Tanks, Old and New

M47 Battery Wing-Nuts

Wing nuts on the battery-hold-down hooks seem to vibrate loose at a great rate, letting the hooks drop behind the fuel tanks.

Fix it by drilling a 1/16" hole in the nut wiring it the frame.

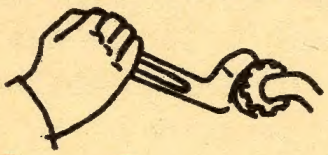
Sticky Hotspot Butterfly On The M47

Sticking causes rough engine performance and rupture of the hotspot diaphragm if it isn't checked often.

Good idea to put it on daily inspection list

M46A1, and M46 Soft Electrical Connectors

The serrated nuts on the AV-1790 engine electrical connections are getting butchered. Their soft material won't stand much tightening. As yet, the right tool for this type connector isn't in the tank's tool set and some people resort to water pump pliers or a drift-and-hammer, then tighten them till they go blah. But if you know any one in the Battalion motor pool, borrow their Wrench, Spanner Hook, Stock No. 41-W-3249-900 the next time you need to make or break those connectors.



Keep in mind... snug them up a trifle more than hand tight and quit.

Bore Evacuators

TB ORD 469 (15 Sept 52) says they should be removed and cleaned weekly, or after 50 rounds, and all carbon and stuff cleaned from the inserts and gas ports. **All** parts that have been in contact with powder gas get cleaned with rifle bore cleaner and then coated lightly with oil.

Keep a thin coat of graphite grease (14-G-938-15) on the gun tube threads.

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Frozen Counterweights (some 90mm guns)

If yours is a tank with a counterweight, remove the weight before firing the piece and take a look at the machined surface of the tube forward of the muzzle threads. If it's rough, and scored with tool marks, it'll likely get stuck and give you trouble. When the gun is fired, metal peelings roll up in the close clearance between the counterweight and the tube and bind the two together. To get rid of this sticking hazard, remove all burrs and tool marks from the machined surfaces of the tube and counterweight with fine emery cloth, then polish them with crocus cloth.

Above all, coat both surfaces with a thin smear of graphite grease or white lead before you screw on the counterweight.

New Priming Nozzles

To keep your AV-1790 engine from swallowing a bitter pill and wrecking itself, get those old priming nozzles out of the cylinders and replace them with the latest type . . . they're cheaper by the dozen. MWO ORD G244-W9 says the trouble is the orifice plate in the nose gets pushed out of the nozzle and into the manifold and cylinders where it generally louses things up.

The orifice plate in the new type nozzles (G262-7410158) is threaded and can't pop out.

Put in all my rolling stock.

Commander's Hatch Seal

Nothing makes a tank commander rage more than when he can't close and lock his hatch for the nite. In case you know a howling M46 or M46A1 tank commander, you might tell him that TB 9-718-5 says his unsatisfactory cupola door seal now can be replaced with a new seal (G262-7355018) which he can get through normal supply channels.

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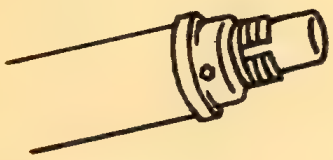

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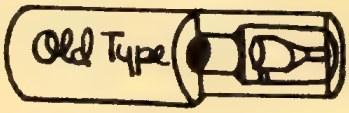

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come now and see the rest of it...
THE NEW M38A1
No matter how you twist and turn it, the 'A1's still a Jeep, fabulous old errand-boy to all echelons. But before you twist and turn it, you better bone up on its new bones.

To bridge the long jump between pilot model and latest production vehicles, PS gives you this fat roundup of facts and figures that cover the new Jeep's development through a scad of use-tests on random batches of new-production vehicles.

Keep in mind that your TM was written, drawn, and photoed at the time the hand-crafted pilot vehicle was accepted and frozen as the master from which all the little carbon-copies were stomped out.

SAME, BUT DIFFERENT

As fast as tests called for changes, their benefits began on whatever serial number linked its arm to that ever-movin' belt in Toledo. So don't knock yourself out trying to find what isn't there, either on your vehicle or in the TM.

If you're supposed to have one of whatever it is, you'll either get a TB, a Fizzmo, or a helping hand from Detroit.

Maybe you'll even see it here if you read PS regular.

F'rinstance, you may know about vapor lock in the earlier model—caused by the fuel line being too close to a hot manifold. Well that's out. The new line runs from the tank to the right side of the frame and then up front and across to the pump on the left—nowhere near the manifold. And to make it easier for you, the air cleaner's now serviced from the top instead of the bottom as before, and

the horn button's adjustment is at the top of the steering column. The old M38 button is adjusted near the bottom at the switch.

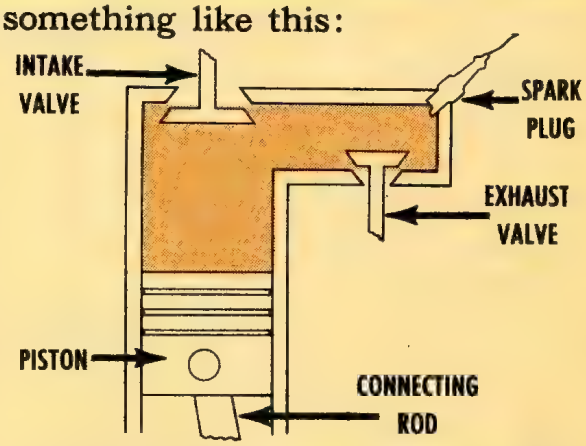
While the M38's service brakes have both cams and anchor bolts, the M38A1 has no anchor bolts. They're the floating kind with the shoe's ends wedged in place and held laterally by clips. This brake has about 20% more gripping action than the '38 and uses a labyrinth seal between the backing-plate and drum.

Besides being controlled by direct linkage, the new hand brake has a "Duo-Grip." This grip has a shoe inside and another outside the drum, working on a single cam, that pull together for action. The '38 has its shoes on the drum's insides and they push outward to stop the wheel. Adjust the cam whenever you adjust the linkage if you want the full value of the shoes.

NEW F-HEAD ENGINE

You'll find plenty of work-room under the hood. This welcome feature is mainly the result of a wider cowl, the shape of the front-end sheet-metal, sending the second battery to the cowl, and the new F-head engine with the carburetor transferred to its upper right-hand side.

It's the shape of an engine that often says what its horsepower's going to be, so the change from the L-head of the M38 to the F-head of the new vehicle is important. As you probably know, the shape is figured by the way the combustion chamber mimics a letter of the alphabet. (TM 9-2700, page 24, has a description of the T, I, and L-head engines.) Compared to the L-head, the F-head's combustion chamber is more compact, makes space for large intake-valve size, needs only one rocker-arm mechanism for each cylinder (for the intake valve), and produces slightly higher compression ratios. It looks something like this:



This kind of set-up leaves few restrictions on the fuel-air intake since the carburetor is over the intake manifold that's cast into the head, and the intake valves open into the manifold, making for a direct flow of the mixture. This way gravity helps, and suction-lift against gravity isn't needed. All of which adds up to the fact that while the bore and stroke of the M38 and M38A1 are the same, with better breathing and a higher compression, the F has 72-hp while the L has 60, giving you a gain of 12-hp and 9 ft lbs of torque over the old Jeep.

In changing the engine, the job

of adjusting the valve tappets was also changed. On the earlier vehicle you have to take off the left fender and make all eight valve adjustments down on the sides. (See page 503 for adjusting-screw tool). In the new models, the fender stays put, but it takes a little extra manipulation to take off the valve-spring-compartment cover without removing the exhaust manifold, and only the exhaust valves are adjusted from the sides. The four intake valves are adjusted on top of the engine.

To meet the changes of the F-head engine, the carburetor and the distributor's centrifugal automatic-spark-advance are calibrated differently.

Like with the last of the M38's, the bell housing is sealed and there's a plug in the glove compartment to close its vent when fording. And since it is sealed, you'll have to use the front of the crankshaft for ignition timing.

At start of production and until the 4-1/2″ starter was installed on the M38A1 engine, the timing marks were located on the flywheel and were visible through a hole in the rear-engine plate.

When the 4-1/2″ starter was included on the engine of the M38A1 the timing marks were changed to a stamped rib on the timing-gear cover and a drilled hole in the crankshaft pulley. By alining the hole in the pulley with the center line of the stamped rib on timing-gear cover, the engine then would be timed at T.D.C. (5°-B.T.D.C. could be determined by establishing an imaginary line approximately 1/4″ counterwise to crankshaft rotation from center line of rib.)

The latest change is two indentations filled with white paint on the timing-gear cover, identified by 5° and T.C.

And finally, the lube orders remain the same, except that since the 'A1 uses double-lip seals on the propeller-shaft universal-joint, you shouldn't find it necessary to grease this point—except during rebuilds. And then install a temporary hydraulic fitting in place of the plug and use a hand gun to grease it.

(This is the last of two introductory articles)

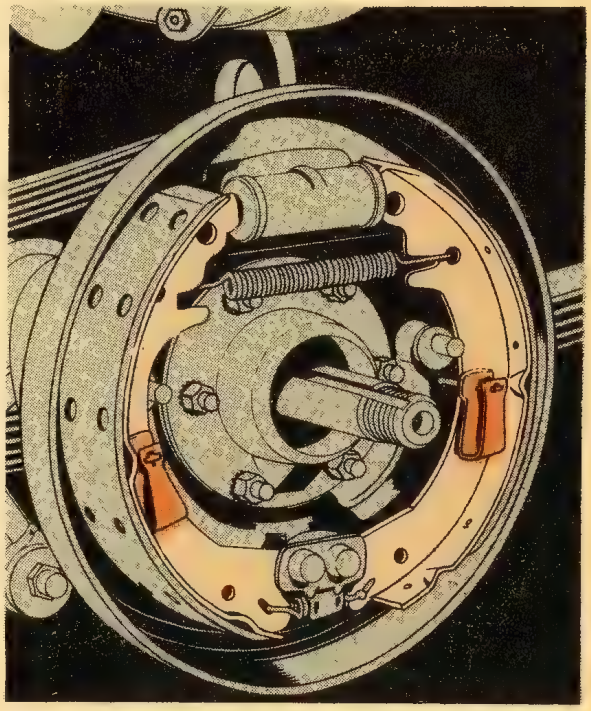


Fig. 1—No anchor bolts here. The brake's shoe is wedged in place and held by clips.

one dozen eggs to unscramble

CONDITION	SO WHAT?	CURE
● Strap to fasten windshield to hood is backwards or short.	Windshield will flap in the breezes when folded.	Turn strap around, get right length strap, or make new one from canvas.
● Someone forgot to fasten down the engine hood.	Hood can be blown up and out of its hinges if not latched down.	Always fasten side latches securely; if broken, fix or get new ones.
● Bracket to hold open engine hood (hooks to w/s latch) is loose.	A gust of wind could bring hood down on your cranium.	Replace or repair hood U-bolt and tack-weld it down.
● Push on fording control-lever won't entirely open fording valves.	Pressure will be built up in the crankcase causing oil to leak.	Lift up hood and be sure valves are open. Free valve and control wire.
● Pocket under fuel tank has habit of collecting debris.	Sharp or pointed junk can puncture the tank when your back's turned.	Scrounge around for some rubber scrap to stuff in the pocket.
● You've adjusted the hand-brake, but the brake still rubs.	Wears mighty quick and leaves you driving with no brakes.	For safety's sake, adjust the inside cam first, and then adjust the rod.
● Mud and sand get through the open bell-housing drain-hole.	Clutch will stick, and then it will chip, and then it will stop.	Put 1/4" street-ell in hole pointed toward the rear; plug ell before fording.
● You find your battery-hold-down wing-nuts are loose.	In no time at all, your battery can shift, and spill, and crack.	Tighten nuts. Washers under nuts give more bolt-threads. Got the right bolt?
● Hand-brake lining's inner-shoe wears fast—especially with mud.	It'll take rocks under the wheels to hold the 'A1 on side of a hill.	Replace the lining when it goes. Meantime watch the parking problem.
● Can't get 'er to travel more than 35 miles per hour.	Good, but only for the early break-in period. After that, it's not so good.	Remove accelerator pedal-stop after 150 miles. Carburetor opening fully?
● There's a hard-to-see timing-mark on the timing-gear cover.	A sad tune at tune-up time.	A mirror lets you see bulge or stamp-mark. White paint will keep it in view.
● Instrument cables kink when replaced in the dash.	So your indicators won't indicate—who can operate with a kink?	When replacing cables in the dash, guide them back through the panel.

Gas valve protector

If your drivers have a habit of walking over the gasoline shut-off-valves on your M135 2-1/2-tons on the way into the cab, try this protector. Notch a 2″ length of 1-1/2″ pipe to clear the fuel line, and weld on a 9″ length of 1-1/2″ x 3/16″ strap (Fig. 1).

The strap goes under the gasoline-tank hanger (protect the tank with some gasket material) and the pipe covers and protects the valve. You'll need one hole in the supporting strap to clear the cap screw on the gas-tank cover-plate.

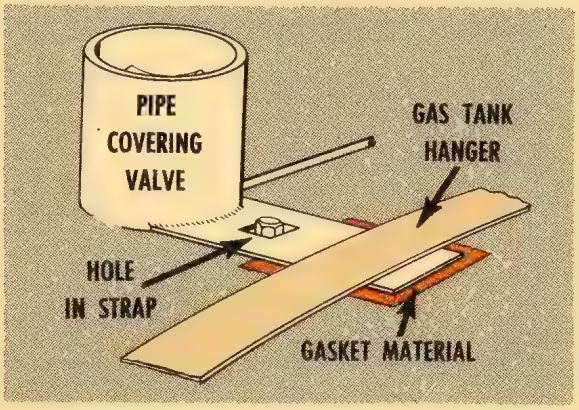


Fig. 1—A neat trick for keeping the M135 gas valve sheltered from your size elevens.

Instrument-test rig

Hooking an old fuel-gage transmitter-unit and a couple of connecting jacks in series with a 24-volt battery will give you a bench check for the electric gages on your dashboard.

Connect the gage and cycle the transmitter unit. If the gage indicator hand follows up and down the scale, your trouble is somewhere else. Conversely, hooking a good gage unit in the circuit will let you check a doubtful transmitter unit.

Brake backing-plate

If you find grease leaking thru your M135's brake backing-plate, could be that it's working thru the threads of the backing-plate retaining-screws. What seals off the leak is Aviation Permatex Form-A-Gasket No. 3; or Cement, Special Sealing, Form-A-Gasket No. 1505.

You don't have to pull the backing-plate to do the job. Take out the retaining screws (Fig 116, TM 9-819A) one

at a time, and replace 'em one at a time. When you remove a screw, smear some of the sealer on the female threads of the steering knuckle and some of the same sealer, sparingly, on the threads of the retaining screw. Replace the screw and torque it to 27-30 foot pounds.

It'll be a good idea to probe the oil drain-slot at the bottom of the steering knuckle with a piece of wire to make sure that this passage is free from dirt (Fig 117, TM 9-819A).

Generator-end-castings

Check the generator adjusting-arm on your M135 to make sure it's assembled on the right side of the front-end-frame casting. The arm belongs **ahead,** not behind the end casting. If it isn't where it belongs, chances are that the casting will break (Fig. 2).

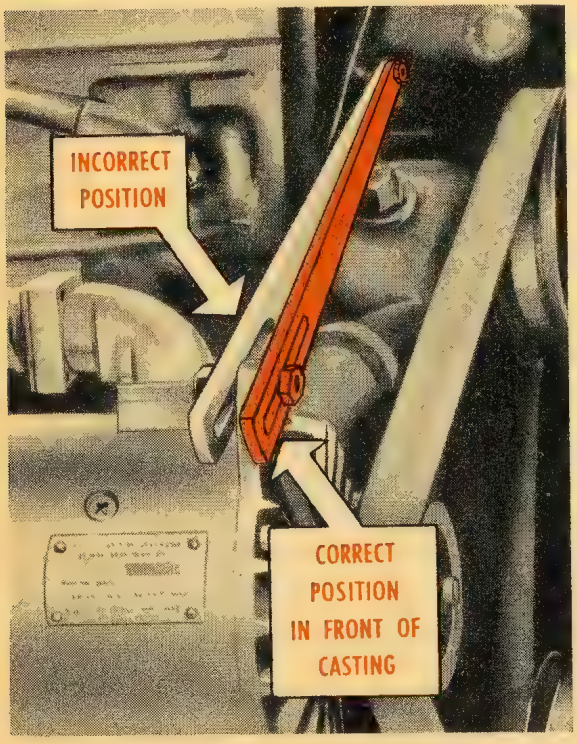


Fig. 2—A misplaced adjusting-arm'll break the M135's generator-end-castings, for sure.

While you're making the check, see that there's a 1/8″ thick flat-washer between the front side of the generator and the adjusting arm, and another 1/8″ washer between the adjusting arm and the thermostat housing where it's attached.

Spark plug electrodes

Here is something that may help you get better life from your ignition harness on any vehicle: When you clean your spark plugs, open the gap enough to get a flat ignition-point-file in, and square up the center electrode before you set the gap.

It's a fact that electricity will flow from a point or a square edge at a much lower voltage than it will from a ball or a rounded corner. So you get a fatter spark at a lower secondary voltage, and less tendency for the current to break down the insulation of the ignition harness.

Protecting from steam

Connie keeps telling you to keep the steam Jenny's steam outa your tank. Saw some M20 Azimuth Indicators being torn down and cleaned out at Divisional Ordnance.

They were full of sludge and rust from somebody running a steam hose on 'em. As the poor guy cleaning them said, "He might at **least** have taped up the night-light hole. Why don't those joe's up front clean these tanks often enough so they don't need steaming?" I couldn't think of a good answer.

Your governor need a punch?

Maybe you've been thinking something's wrong with the vacuum-operated accelerator-pump, or carburetor, or governor on your 2-1/2-ton GMC's (CCW and CCKW)—and maybe you're getting close to the whole truth. Could be the replacement governor you got doesn't have the vacuum port-hole punched all the way thru the governor body, and could be the vacuum channel is blocked by an edge of flashing. This means that the manifold vacuum isn't getting thru to the carburetor, and this is a possibility on Monarch governors, Mfrs. Part No. 753-52.

A minor operation (Fig. 3) should've been performed on that governor before installation. And, of course, the governor-to-carburetor gasket should also have a corresponding by-pass hole.

Tank work stands

Saw a handy gadget in a Battalion motor pool at Fort Hood. A staircase, or work stand, which they ran up alongside the tank to get at it, and to prevent climbing up each time they needed a tool or something from the ground. A floodlight and a couple of electrical outlets on the stand could increase its usefulness.

Of course, this was a strictly level-floor shop deal, but I'm wondering about a temporary platform for the back of a 3/4-ton to do the same thing in the field. A lighting plant in the bed would give power for lights and power tools, while the tool kits could ride on the platform. Hm-m-m?

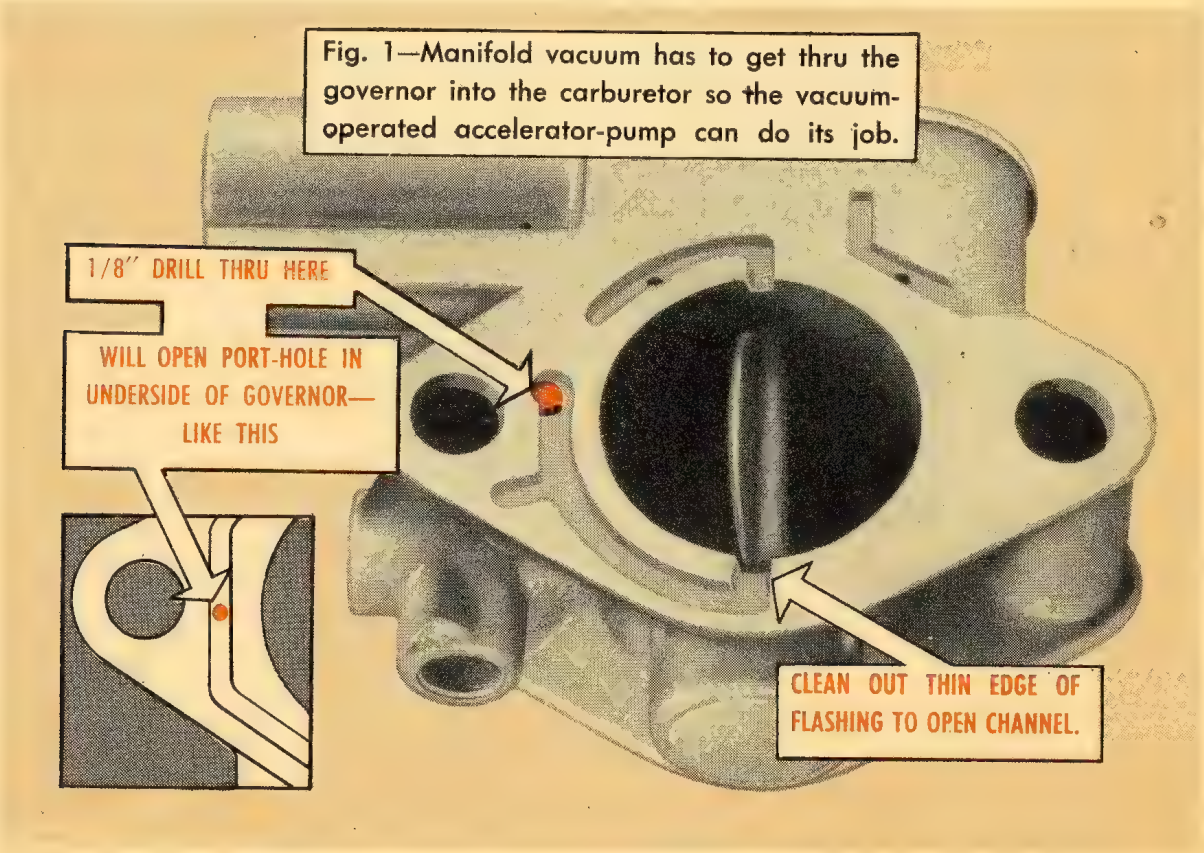


Fig. 1—Manifold vacuum has to get thru the governor into the carburetor so the vacuum-operated accelerator-pump can do its job.

Convoy markers

Connie saw a real sharp convoy the other day. They had taken the old idea of "Convoy" signs and instead of having one at the front and one at the rear of the convoy, they had one on **each** vehicle.

The smart angle on this was that they had their headlights **off.** I, for one, see no excuse for running a vehicle in the daytime with the scarce and expensive 24-volt headlights burning when a simple sign made of scrap materials will do just as well to identify it as part of the convoy.

CD-850-4 transmission replacements

It's OK to replace a CD-850-4 transmission in your M46A1 or M47 tank with a CD-850-4A. The -4A transmissions are made for our newer tanks, and they're also being supplied as a substitute for the -4.

So if you get a transmission from supply that has no flapper valve in the "Oil In" line, and only one stud at the top of the steering gear "hump" instead of two, it's a -4A transmission. If you don't find these distinctive differences, look at the identification plate —it'll be marked CD-850-4A.

As far as the -4A's rear oil-balance line is concerned—some people may tell you it isn't necessary on this model. This may be so, but it's a good idea to always install that oil line just so it'll be handy in case you get a -4 later on.

The only functional difference between the two transmissions is that with the -4, the tank can be started when pushed in forward or reverse gear, whereas the -4A can be push-started only in forward gear.

As far as the lowly M46 is concerned . . . the -4A transmission will fit, but it's only recommended for M46's that have a final-gear ratio of 4.47 to 1, (this marking appears on the final-gear housings). M46's that have the old, lower final-gear ratio (which is **not** marked on the final-gear housing) better stick to the -4 because if a -4A is mounted to the low gear-ratioed final-drives, the tank will be sluggish—not enough power to pull a sick woman out of bed.

CD-850 studs

Some people are having difficulty identifying the different markings between the standard and oversize studs used in CD-850-4 and -4A transmissions. You can identify the studs by the etch marks found on the fine thread end of the stud. The oversize studs come in four sizes (as shown in chart below).

TABLE OF ETCH MARKS FOR OVERSIZE STUDS

ORDNANCE PART NO.	SIZE	ETCH MARKS
7767858	STD	NONE
7520649	0.003	ONE
7520650	0.006	TWO
7520651	0.009	THREE
7994721	0.012	FOUR

How to do it the right way

BRAKE ADJUSTMENT on the 3/4-ton M37 Truck

For some time there has been a weeping and a wailing and a gnashing of teeth over the proper brake-adjustment procedure on your M37. Here's the latest on how to trouble-shoot this new-fangled factory-bonded brake lining and its adjustment.

The service-brake lining on your M37 brake shoes is tapered. This affects the radius so that heel and toe clearance, most times, will be a lot more than you've been used to when the new brake shoes are centered in the drum. The clearance may vary from one shoe to the next, but should be equal on heel and toe of any one shoe. The idea was adopted to overcome brake squeaks and provide good control under all operating conditions.

Because the lining's tapered, the adjustment has to be **right.** It can be done without any special tools if you follow the procedure shown. And when the job's done properly, you'll be able to **feel** the drag when you pull with **both** hands on the outside of the tire and move the wheel. This, on new lining—only slightly less on worn lining.

1. Before you start, be sure the wheel bearings are correctly adjusted, the brake-pedal free-play within specified limits, and the brake linings free from grease and oil.

2. Naturally, the inspection-hole covers must come off the brake drums (Fig. 1).

3. For a minor brake-adjustment on new linings, turn the upper cam adjusters with a 3/4″ box-socket wrench until the brake lining is in contact with the drum (Fig. 2). The contact is localized over the center portion of the lining, and the shoes should be adjusted to provide a heavy drag between the lining and drum.

4. For a major brake-adjustment on new linings, loosen the brake-anchor-bolt nuts with a 15/16″ box-socket wrench. Turn the anchor bolts to the fully released position (Fig. 3) with a 3/8″ wrench. Check clearance between brake linings and drums—alternating between the brake anchor-bolt and cam adjuster for each shoe until you get equal clearance at the lining ends, top and bottom. The center of the lining should be in contact with the drum so that a heavy drag exists. The anchor-bolt nuts must be tightened after you make the adjustment, and when you're finished, remember to replace the inspection-hole covers.

Note: For a major adjustment on worn linings, adjust for proper centralization as per paragraph 153c, TM 9-840.

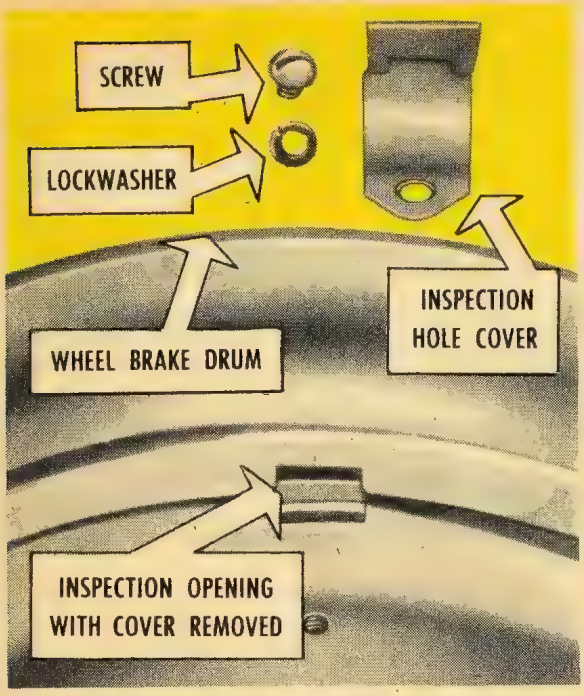


Fig. 1—You remove the inspection-hole covers first. There's some difference of opinion on whether you "see" or "feeler" to adjust—you better do what you do better. Just get the adjustment right.

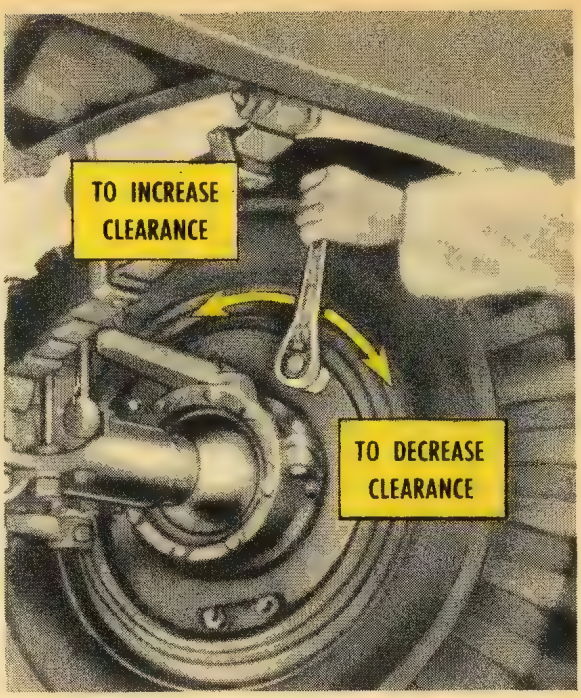


Fig. 2—With the wrench in a horizontal position on the cam adjuster, pull down on handle to decrease the clearance and push up to increase the clearance between the brake lining and the brake drum.

Fig. 3—When your anchor bolts are turned to a fully released position, flats on bolt-ends should be horizontal, and punch marks or arrows on threaded ends, together and in line. Use a scale like you see it.

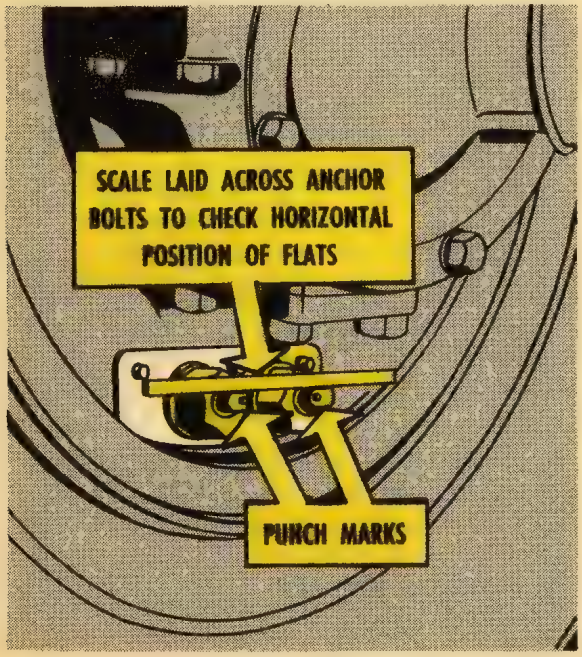
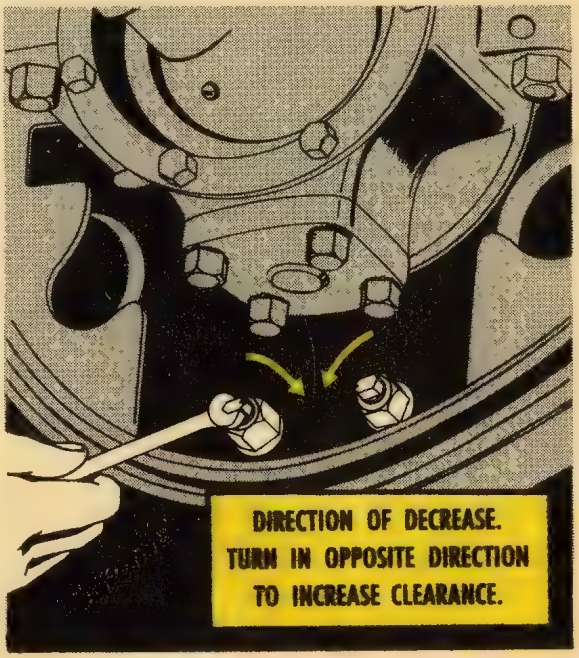


Fig. 4—Turn brake shoe anchor-bolts down to decrease clearance between drum and lining. Do this by moving handle end of the wrench upward, which causes shoe to move down and out toward the brake drum. Note the arrows.

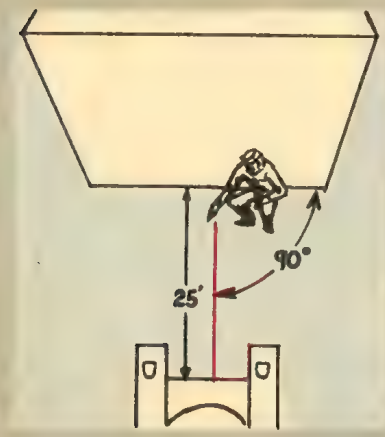


Glare from headlights has tossed many a driver (and crew) off the battlefield and onto the casualty list. It may not be possible to get at the blinding lights of oncoming vehicles, but to help keep from becoming a statistic, you can check **your** headlights to make sure they don't blind the next guy that's trying to steer clear of **you.**

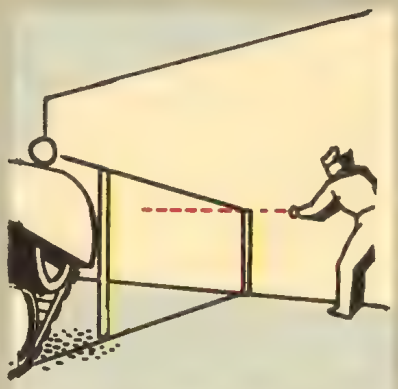
HEADLIGHT AIMING

ON THE M46 AND M47 TANKS

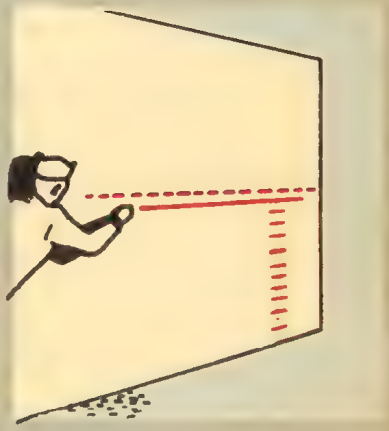
PLUS ANY OTHER TANK-LIKE VEHICLE EQUIPPED WITH BALL AND SOCKET MOUNTINGS. (T4IEI T18EI M46AI T98EI T97 T99EI)



1. Mark a 25 ft. line on level ground right angles to a wall; then straddle line.



2. Mark wall exact height as the headlight center. Divide distance between mark and ground by 12.



3. Now draw a line 1/12 distance between marking on wall and the ground.

7. Turn on your lights . . . cover one while aiming the other. Then . . .

8. Aim left light so hotspot centers on left intersection and right light on right intersection.

9. Tighten both light mounting nuts . . . Easy on 'em or they'll go wacky again.

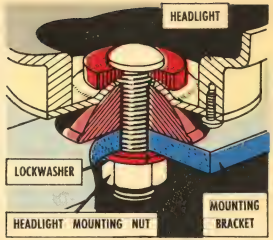
Glare from headlights has tossed many a driver (and crew) off the battlefield and onto the casualty list. It may not be possible to get at the blinding lights of oncoming vehicles, but to help keep from becoming a statistic, you can check **your** headlights to make sure they don't blind the next guy that's trying to steer clear of **you.**

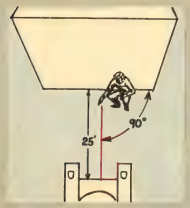
HEADLIGHT AIMING

ON THE M46 AND M47 TANKS

PLUS ANY OTHER TANK-LIKE VEHICLE EQUIPPED WITH BALL AND SOCKET MOUNTINGS. (T41E1 T18E1 M46A1 T98E1 T97 T99E1)

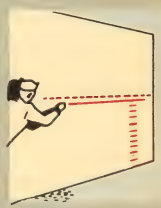
Here's how to properly aim and adjust headlights that have the ball and socket mount.





1. Mark a 25 ft. line on level ground right angles to a wall; then straddle line.

2. Mark wall exact height as the headlight center. Divide distance between mark and ground by 12.



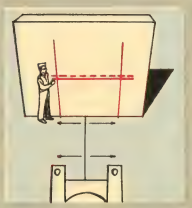
3. Now draw a line 1/12 distance between marking on wall and the ground.

7. Turn on your lights . . . cover one while aiming the other. Then . . .

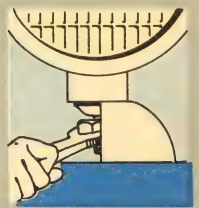
8. Aim left light so hotspot centers on left intersection and right light on right intersection.

9. Tighten both light mounting nuts . . . Easy on 'em or they'll go wacky again.

4. From light centers, drop a plumb line; measure from point on ground to 25 ft. line.

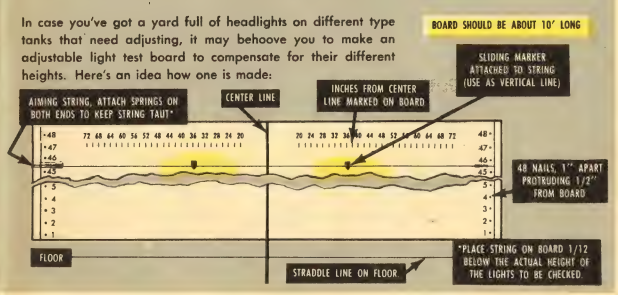


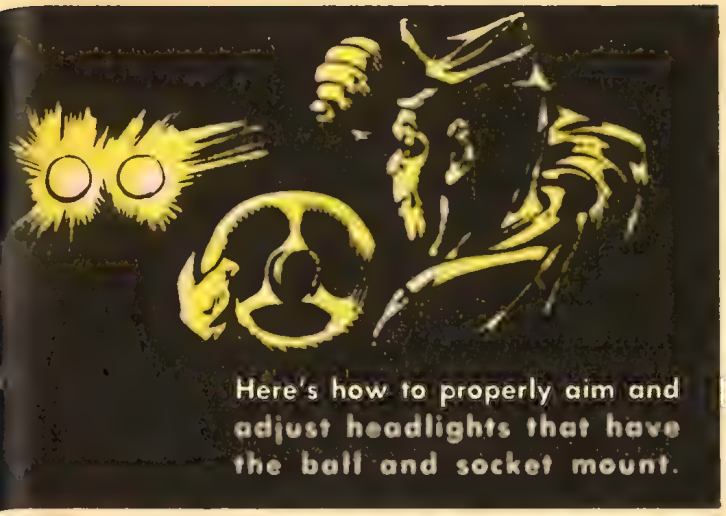
5. Measure off same distance at wall, mark vertical lines smack in front of each light.



6. Loosen both the light mounting nuts until the lights barely move.

In case you've got a yard full of headlights on different type tanks that need adjusting, it may behoove you to make an adjustable light test board to compensate for their different heights. Here's an idea how one is made:


BOARD SHOULD BE ABOUT 10' LONG
SLIDING MARKER ATTACHED TO STRING (USE AS VERTICAL LINE)
AIMING STRING, ATTACH SPRINGS ON BOTH ENDS TO KEEP STRING TAUT*
CENTER LINE
INCHES FROM CENTER LINE MARKED ON BOARD
48 NAILS, 1" APART PROTRUDING 1/2" FROM BOARD
FLOOR
STRADDLE LINE ON FLOOR
*PLACE STRING ON BOARD 1/12 BELOW THE ACTUAL HEIGHT OF THE LIGHTS TO BE CHECKED.



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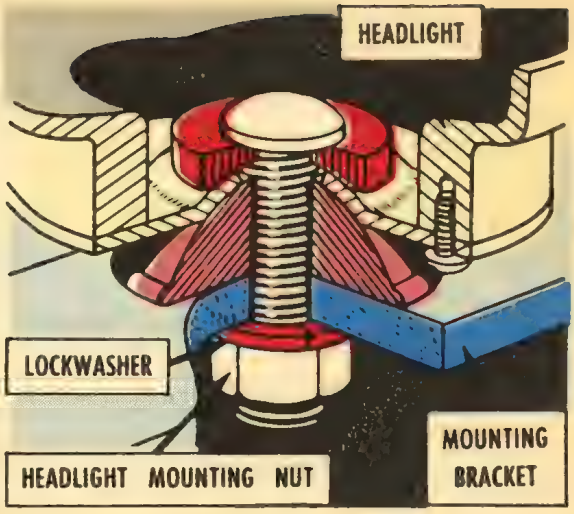
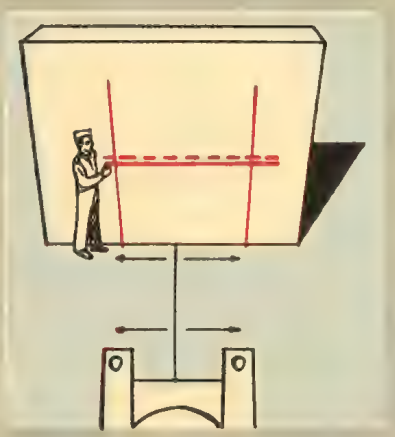
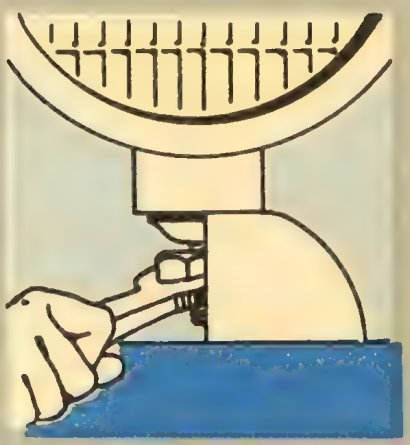


4. From light centers, drop a plumb line; measure from point on ground to 25 ft. line.

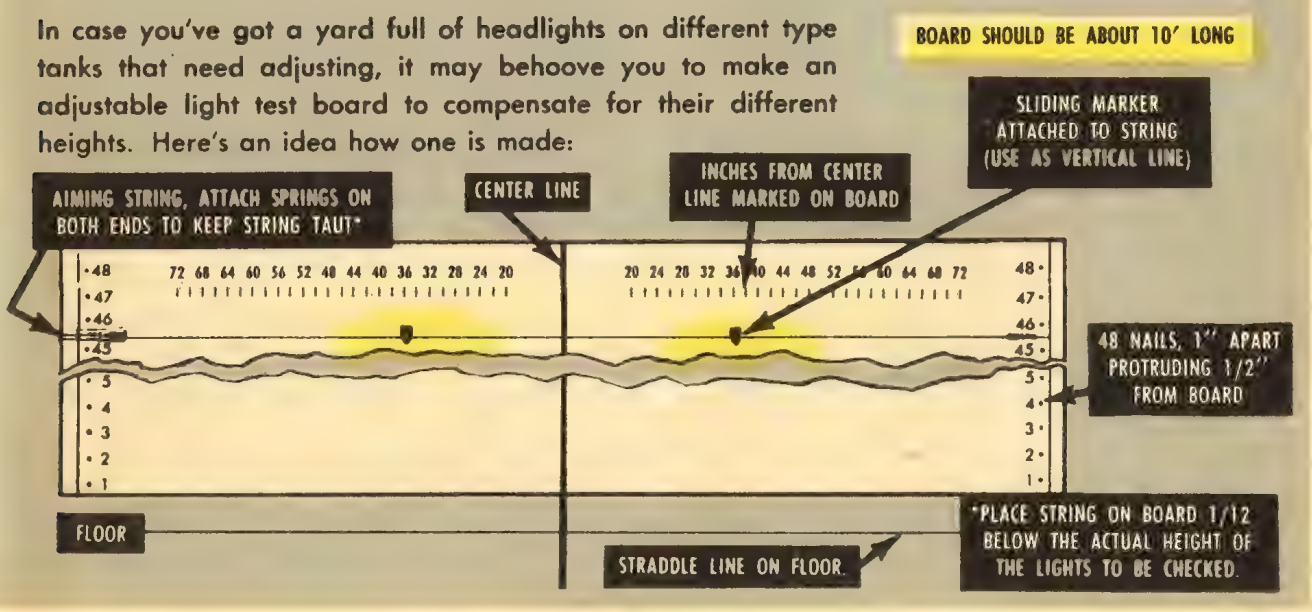


5. Measure off same distance at wall, mark vertical lines smack in front of each light.



6. Loosen both the light mounting nuts until the lights barely move.

In case you've got a yard full of headlights on different type tanks that need adjusting, it may behoove you to make an adjustable light test board to compensate for their different heights. Here's an idea how one is made:


BOARD SHOULD BE ABOUT 10' LONG
SLIDING MARKER ATTACHED TO STRING (USE AS VERTICAL LINE)
AIMING STRING, ATTACH SPRINGS ON BOTH ENDS TO KEEP STRING TAUT*
CENTER LINE
INCHES FROM CENTER LINE MARKED ON BOARD
48 NAILS, 1" APART PROTRUDING 1/2" FROM BOARD
FLOOR
STRADDLE LINE ON FLOOR
*PLACE STRING ON BOARD 1/12 BELOW THE ACTUAL HEIGHT OF THE LIGHTS TO BE CHECKED.

JOE DOPE
DID YOU HEAR THE ONE ABOUT LUCKY PIERRE?
...NO TELL IT TO ME!
WELL, SEEMS PIERRE WAS (LUCKY FOR HIM) DRAFTED LAST YEAR... A WEEK AFTER HE WAS FIRED OFFA HIS JOB.
VISIT FLORIDA
RIO
He was gonna "scrooge" the Army . . . and avoid doin' anything more than he had to.

It wasn't that Pierre was not a good student . . . he was lucky. He could learn just enough to squeak thru quickly . . . Any extra time was a dividend, he figured...

HEY PIERRE, WHO TOL' YOU Y'CAN TAKE A BREAK?

All thru early basic it was the same.

I'VE REASSEMBLED MY WEAPONS CORRECTLY ...NOW WHILE THE REST PRACTICE I'LL DO A LITTLE SACK TIME.

Considering the amount of work he put in . . . his results were sheer luck . . .

HEY PIERRE, Y'GOT A HIGH SCORE ON Y'R MECHANICAL APTITUDE TEST.

And if perchance his luck waned . . . he gave it a little shove.

HERE'S FIVE BUCKS FOR CLEANING MY RIFLE...HERE'S FIVE FOR LAST WEEK.

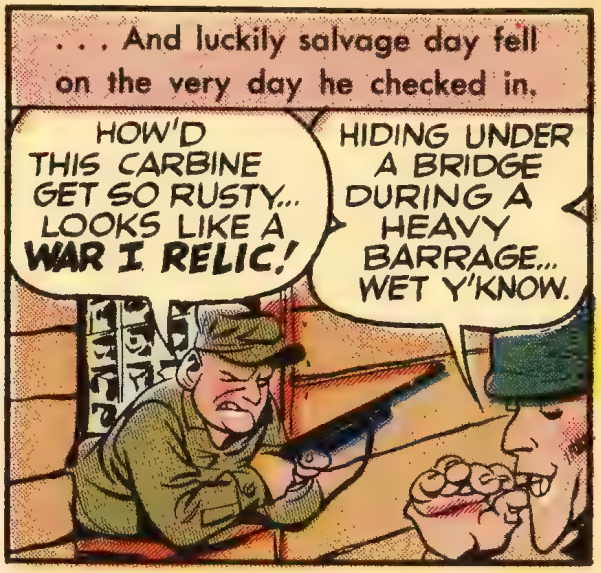
Once his natural ability showed up . . .

PIERRE, YOUR GRADES RECOMMEND YOU FOR PROMOTION.

. . . But he managed to escape the responsibilities of a rank . . .

BUT YOU'RE SO SLOPPY...SO LAZY... THAT I'M TURNING YOU DOWN.

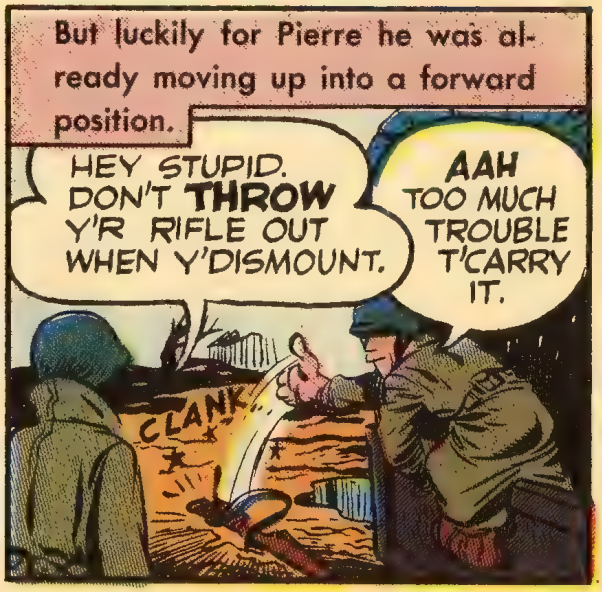
Then he was shipped to Korea as a replacement in a Recon outfit . . . A very lucky thing for Pierre because his gear was in such bad shape . . .
WHERE'S SUPPLY?


. . . And luckily salvage day fell on the very day he checked in.
HOW'D THIS CARBINE GET SO RUSTY... LOOKS LIKE A WAR I RELIC!
HIDING UNDER A BRIDGE DURING A HEAVY BARRAGE... WET Y'KNOW.

And with his usual luck he managed to keep one step ahead of supply . . .
WHATSAIDEA ISSUING ME A GUN THAT WON'T SHOOT... DOGGONE FIRIN' PIN WON'T WORK!

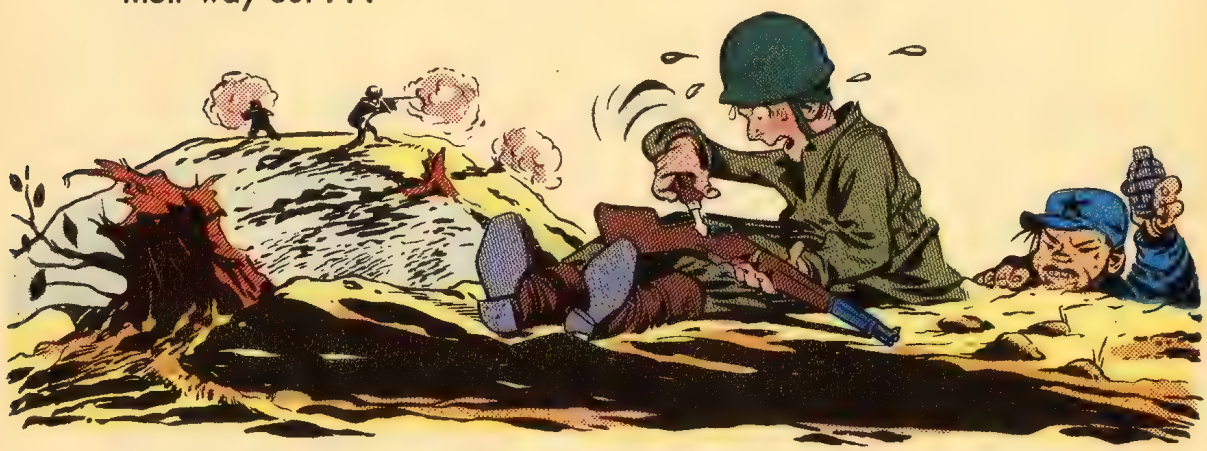
TEE HEE...THIS EXCHANG'LL KEEP ME OUTTA CLEANIN' A RIFLE FOR ANOTHER WEEK... AT WHICH TIME I'LL OVER-OIL IT AND GIT ANOTHER.
?

WHERE'S THAT ☆@@✶#%!! PIERRE? HE DIDN'T OIL HIS CARBINE AFTER COMIN' IN FROM THE COLD, SO WHEN HE WENT OUT AGAIN THE "SWEATY" PARTS FROZE...


But luckily for Pierre he was already moving up into a forward position.
HEY STUPID. DON'T THROW Y'R RIFLE OUT WHEN Y'DISMOUNT.
AAH TOO MUCH TROUBLE T'CARRY IT.
CLANK...

Yesterday . . . the outfit went on a reconnoiter.

Last night his patrol got cut off . . . After a night of rain and sleet, every man naturally dismantled his automatic weapons and oil-cleaned 'em . . . By dawn they were ready to run for it and shoot their way out . . .



They all got out fine but Pierre. He had goofed off on the cleaning . . . (which wouldn't have helped since he had a two-week old mud cake in his barrel) and so he stayed there . . . Alas, ol' lucky Pierre . . . he sure scrooged the Army.

PRODUCED UNDER SPECIAL LICENSE TO U. S. DEPT. DEFENSE COPR. 1953 WILL EISNER PRODUCTI

JOE'S Dope Sheet
Expendable parts to our Joe
Are recovered by men in the know
For the stuff that he junks
Cost the rest of us hunks
Of highly desirable dough.
SCRAP
EXPENDABLE? RECOVERABLE?
WE HAVE THE WORLD'S BEST EQUIPMENT.. Take care of it

PRODUCED UNDER SPECIAL LICENSE TO U. S. DEPT. DEFENSE COPR. 1953 WILL EISNER PRODUCTIONS

Expendable parts to our Joe
Are recovered by men in the know
For the stuff that he junks
Cost the rest of us hunks
Of highly desirable dough.

UIPMENT...Take care of it

IONS

DRIVER TESTS

Dear Half-Mast,

Here's one for you—I've been a driver in the Army for a long time and every time I transfer to another station I have to take another driver's test. Most times there isn't any change except the road signs.

My suggestion is to give new drivers coming into the army a driving test on the larger trucks—say 2½-ton, 5-ton, or even larger, and then not make them go thru it again except for periodical retests regardless of transfers. Wouldn't this save the Army some time and the taxpayers money?

SFC T. E. W.

Dear SFC T. E. W.,

Actually, drivers aren't supposed to be tested over again at every Post they go to—once you get a driver's license it's supposed to go along with you to a new station in your 201 file. And you get a retest every year, according to the book.

If you're sent overseas where traffic is handled differently, or you are assigned to drive different types of vehicles than you're licensed for, or you're switched to different cargos (such as ammo), then more testing (or orientation, as they call it) is a must. But sooner or later you'll be qualified to do any of the driving in the Army.

At the rate you're going you'll be an expert and soon there won't be any more tests for you to take except the brush-up once a year. Happy day!

Half-Mast

IN-LINE RESISTORS

Dear Half-Mast,

We are at a loss to understand the purpose of the in-line resistor in the primary ignition circuit of the M34 2-1/2-ton (TM 9-819, p. 155, Fig. 57).

We would also like to know the purpose of the three capacitors located in this distributor assembly.

Capt R. S. C.

Dear Capt R. S. C.,

You had it right when you described this widget as the in-line resistor. That

is exactly what it is, and its purpose is simply to allow the use of a particular 12-volt coil (which is already in production) in the 24-volt electrical system.

As to the three capacitors or condensers you found in there, one of 'em is the usual ignition condenser, connected across the breaker points to prevent arcing and induce a faster collapse of the primary magnetic field; the other two are part of the radio-interference-suppression system.

Half-Mast

OIL-FILTER OIL LEAKS

Dear Half-Mast,

We've been having trouble with oil leaks around the base joints of the oil filters on our M41, M51, and M52; 5-ton trucks. We have made new gaskets and, as a last resort, used Permatex to insure that the seal is permanent. Can you tip us off to any other fix for this leak?

MSgt P. A. M.

Dear MSgt P. A. M.,

You may be getting that oil leak because of an over-hard bottom gasket, a loose center-tube adapter at the base inside the filter (Fig. 1), or could be that you're pulling the outer shell down too tight on the new and softer neoprene gasket that's now being used. If you pull the outer shell down too tight, you'll cut that gasket right in two.

Check the center-tube adapter because, if it isn't tight, the shell of your oil filter won't pull down snug enough on that bottom gasket. To get it tight, you'll have to take your vehicle to your nearest maintenance shop and get them to do the job. They'll tighten the adapter with the newly issued "Wrench, Tubulur, Deep Socket, 41-W-2941-980" which slips down over the center tube and onto the adapter like the tool shown in Fig. 2. Remember—not too tight, not too loose on that top cover-fitting—snug 'er up, and stop.

Half-Mast

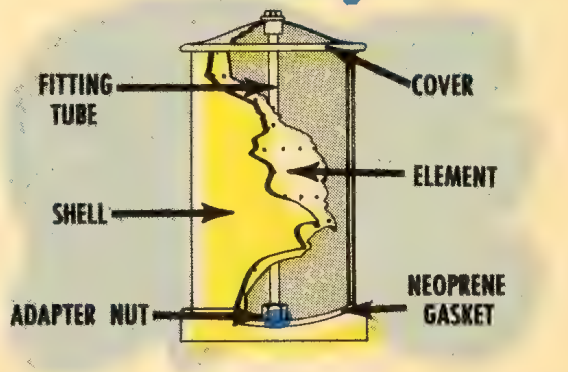


Fig. 1—That 5-ton oil leak may be caused by a loose adapter-nut at the filter base.

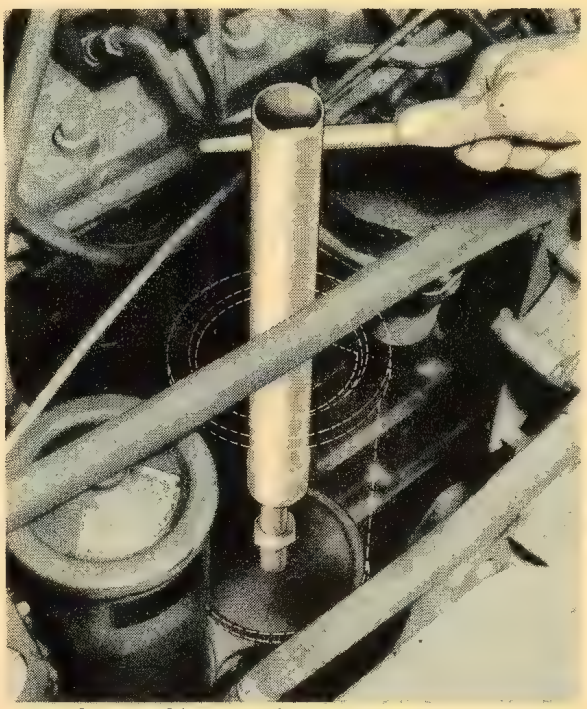


Fig. 2—Oil-filter leaks on your 5-ton trucks can maybe be eliminated by using this tool.

DUAL TIRES

Dear Half-Mast,

What is the advantage of using dual tires on trucks when single ones would do? We only run them on good paved roads, never overload them or abuse the tires with over-pressure or speeding—unless perhaps in the case of maneuvers or war.

WOJG F. R.

Dear WOJG F. R.,

There, you said it ". . . unless maneuvers or war."

Tactical vehicles are built to take the gaff. And sometimes the gaff that comes calls for all they've got. Like Korea, f'rinstance.

True, a big single and a pair of duals are built to carry the same payload. But the one big 11.00 x 20 tire takes as much crude rubber to make and costs about the same as a pair of 9.00 x 20 duals. So the score's about even on economy.

The smaller circumference of the dual tires makes possible the flat-bed bodies with their better loading advantages.

There's tactical advantages, too, proved out over many miles and many months of tests on all surfaces in all weather (see p. 459). There's really no argument; duals are better for most military uses.

Half-Mast

LIFTING TAILGATES

Dear Half-Mast,

Using the forks on high-lift trucks (MHE) to lift the tailgates on semi-trailers out of the sockets is causing the lower board of the tailgate to crack and break so that it must be replaced.

If the use of forks on tailgates is standard practice, damage could be reduced and replacements avoided by adopting the following suggestions: (1) that the lower edge of the bottom board be encased in metal heavy enough to prevent damage from the forks; or, (2) that the bottom board be made narrower and that a metal strip, with openings for forks, be installed at

I SAID A...

T'aint often yer ole sergeant gets his foot in his mouth. And even then, he's usually able to get it out before it gets rammed down his throat.

Not this time. This time I gotta eat it, medium rare.

I answered a guy's letter about amperage and voltage in his charging circuit, and I said to him that one of 'em couldn't exist 'thout the other, which was what he wanted to know for all his intents and purposes.

I sent him to the TM's for the pure theory if he wanted to go that far, but I guess I went a little too far m'self when I used that word **exist.**

Y'see the word voltage, in a way, means **potential** voltage, or you might say **existing**

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WOJG C. H. P.

Dear WOJG C. H. P.,

You are right, sir. Tailgates are like olives. They do better when lifted with fingers instead of forks. They aren't built for a lot of pressure, and using forks on 'em ain't standard practice around my neck of the woods.

It shouldn't be too much trouble, in most cases, for a couple of men to lift the tailgate out of its sockets by hand. Little more work, maybe, but the lower board stays all in one piece—no damage, no need for replacements.

Half-Mast

I SAID A... DIRTY WORD

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Y'see the word voltage, in a way, means **potential** voltage, or you might say **existing** voltage, whether it's going any place or not. Any little ole dictionary'll tell you that, much less any of the seven-hundred-forty-three ivory-bound reference books I been bruised with since that letter got printed.

So even if I could weasel out of it, which I can't, I wouldn't try. Voltage can exist without amperage. It does that little thing all the time right in your battery. It's there a'waitin whether you use it or not.

It's only when it starts to go places that there's got to be some amperage holding its hand, and vice versa.

There, I've said it, and I'm glad you're glad.

Now maybe I can exist (you should pardon the expression) with a little less amperage around my ears.

Half-Mast

LEAVE IT WHERE IT BELONGS

Dear Half-Mast,

A lot of magazines and newspapers advertise the use of a roll of toilet-tissue (in a special holder) as an oil-filter element. Does it really work? I have a hard time getting the 8-E 1000 element. Is it OK to use the toilet-tissue element on Army vehicles?

Cpl D. M. T.

Dear Cpl D. M. T.,

The true value of this gimmick is still in the hasseling stage with hot-rod enthusiasts. People who favor the toilet-tissue element say that there's no reason why it shouldn't do a good filtering job—and, of course, its price cuts down the cost of filter elements considerably.

Those who are agin' it point out that tissue lint may clog and stick; for example, the small, drilled oil-passages in the crankcase and the tiny grooves on the rocker arms. Also, it's said the tissue won't stand a chance against the condensation from the crankcase . . . especially in cold weather operations.

Be it as it may, the fix is considered unwise and it isn't authorized—even as a field fix.

As you probably know, you can operate without the filter element in an emergency as long as you clean and drain the filter case regularly. But be sure to add extra oil to take the place (in volume) of the filter element.

Fuels Service people tell me that stocks of 8-E 1000 are high . . . hope you find them easier to come by now.

Half-Mast

the bottom of each tailgate.

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Half-Mast

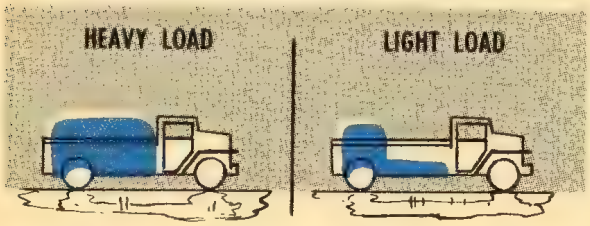
ICY DRIVING

Like any other slippery character, we can deal better with our truck on ice if we learn, beforehand, what to expect.

With ice under wheel, tires haven't got their usual grip on the road, either fore-and-aft or sideways. An over-all way to avoid trouble is to do your driving, not where you are now, but down the road where you expect to be shortly. If a stop is coming up, get the speed off the truck way back here. Not all at once up there.

Look well ahead and plan your moves well ahead. And before you hit the icy road, know what you can do to make that trip a little less slippery.

WEIGHT DISTRIBUTION

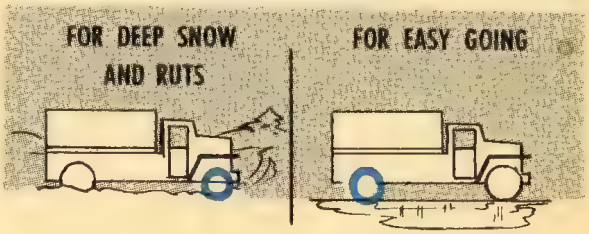


The kind of truck you're driving is your clue on how to load it. If it's a two-wheel-drive or a commercial model, get the weight over the driving wheels. In case it's a light load, (1/4 of truck's rated capacity or less) you'll get more traction by loading way to the rear. However, speed makes a difference. Too much load at the rear also increases the tendency to skid out on turns. And you want to make sure that your unbalanced load is well lashed down so it won't shift.

So figure on all the conditions. If you have a light load for a short drive, or expect to need every bit of traction you can get to travel slippery hills, load well to the back. Then remember to take it extra easy on the turns, or you'll have the load coming up beside you.

On the other hand, with a full load for a two-wheel drive, or in the case of a four or six-wheel drive, you're better off to load as usual. The point is that your full load gives you all the traction there is anyway, so in case you do have trouble, the load is as low and secure as possible.

TIRE CHAINS



What do you do when you find yourself with only one set of chains for a four-wheel-drive vehicle? Where to put 'em? It is mainly a question of where you are going.

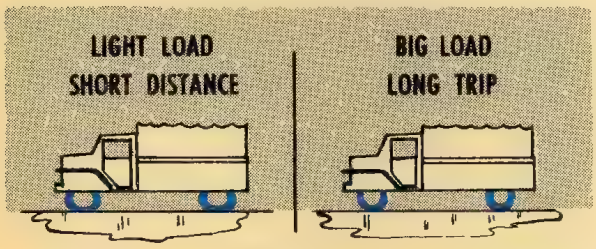
If you have lots of deep snow and ruts to worry about, chains on the front wheels will help you steer around the ruts (in front drive, of course) and will

let your front wheels chew their way through the deep snow instead of being pushed through by the driving wheels. But, if the going is fairly easy, put the chains back on the driving wheels where they'll be under the weight of the load. The load weight gives the driving wheels more bite in hard ice or packed snow. Naturally, on a two-wheel drive, the chains go on the driving wheels.

If you have the World War II GMC with the two spare tires, put them on the front wheels as duals, and with three sets of dual chains, this combination will go darn near everywhere.

Speaking of chains, sedan drivers please remember that the total life of a set of chains on dry concrete is very short—about 50 miles—and doesn't do the tires any good. It would pay you to put a set of fatigues in your trunk when you toss in chains. Then you needn't hesitate to get out and remove the chains when you encounter dry pavement.

TIRE PRESSURE



The various TM's give the approved reduced pressures for the different type tires for maximum traction on ice. But—all this traction is gained at the expense of greater sidewall deflection, so again we gotta consider where we are going and over what.

Military necessity or not, you are not going to carry a maximum load too far with minimum tire pressure, and there comes a time when the traction you get from deflated tires is no greater than that you get from full loading anyhow. If you are just going a short distance with a light load, deflate away. But if you have a two-hundred-mile march with full load, fall back on sweet reason and don't come in on six flat tires.

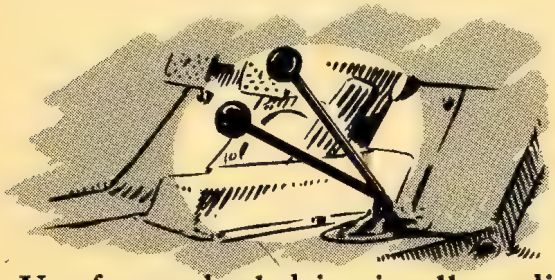
With the new fleet, the air compressor and hose will let you deflate for the worst going and re-inflate for the rest. In any case, when you have the tire softened up till the entire tread is on the ground, that's all the gain you'll get—any more is just destructive to the tires.

WHICH RANGE?

When driving a combat-type vehicle, or any truck with a wide spread between high range and low range, there's nothing to be gained by using low range unless the grade or type of ground would call for low range anyway—icy or dry weather. In general, the lower gears make it tougher to drive without spinning the wheels. Too much power at the wheels makes control at the throttle too hard. **A spinning wheel has only a fraction of the traction of a wheel that is not slipping.** But by driving in the highest gear that will pull the load without lugging the engine, you can use more throttle with less chance of spinning.

Also, low range has a tremendous braking effect and can hold your wheels back on a down-grade to the point at which they'll slip out from under you.

FRONT-WHEEL DRIVE



Use front-wheel drive in all conditions of complete ice coverage or snow. Although a good exception is on level roads with a hard coat of glare ice when even a slight difference between the front and rear-wheel speeds can break one set of wheels loose. In such a case, leave the front drive out unless you find the drivers spinning. (Some sharp operators make their starts in front drive and then pull it out under these conditions.)

On the new fleet, this selection is out of your hands. The only reported trouble from the automatic front-drive on some of the new trucks came from the front drive engaging in a turn on glare ice—which can increase the turning effect of the front wheels and make a truck skid to one side. This only happens when you use too much speed and too much power in the turn, breaking the rear-wheel traction and engaging the fronts. It is possible to reduce power just a little in the turns, even up-grade; but here again, it's got to be gradual because complete release of the throttle can cause a skid the same as if you'd tap the brakes. Be easy.

DOWNSHIFTING

As a rule, both up-grade and down-grade, use the highest gear that will do the job. The point is to keep moving and keep traction, because you need traction to keep moving. This is even more important on downhill grades than on up. Uphill, you might be able to stop—downhill, you'll certainly take a sleighride. The place to slow down is **before** you start down the grade. The new M135's call for special treatment in this matter since the shifting is not all in the driver's hands. The only thing to do is be easy on the throttle uphill, and ready to use more throttle on the downhill if the wheels tend to break loose. There is a trick of using a little brake for the front wheels and some power to keep the back wheels from retarding too much, but this is for you to practice in the open before you ever try it in traffic—because brother, it is one of those tricky only-if-you-really-gotta stunts that takes real finesse.

If hasty braking or clumsy decelerating starts you into a slide—take a deep breath and nudge the gas until you pick up enough traction to slow down again gradually. In any case, keep cool. Panic never helps, but usually gets you in deeper.

It ain't easy. The only people who have fun on ice are on skates. **Your** best tools are a shovel, a sack of grits, a level head, and a gentle foot. Yes, and good luck.

SPASMODIC PERSONNEL-HEATERS

Dear Editor,

Repeated failures of the 24-volt, Southwind personnel-heaters—in everything from Jeeps to tanks—plagued us during the winter season. Warped burner-pocket baffles changed the flow of combustion air, formed hotspots in the heat exchanger, then the heat exchanger would overheat and activate the overheat switch and keep turning off the heater.

Here's how we modified the heat exchanger to get steady heat:

1. Remove the air-blower-motor assembly and the igniter.

2. Take a used igniter, remove all the inside parts, and bore a 1/2″ hole through the center line of the igniter shell.

3. Place drilled igniter shell in igniter well to serve as drill bushing and guide.

4. Drill a 1/2″ hole through the baffle plate. (It's about 2″ inside the exchanger burner-pocket.)

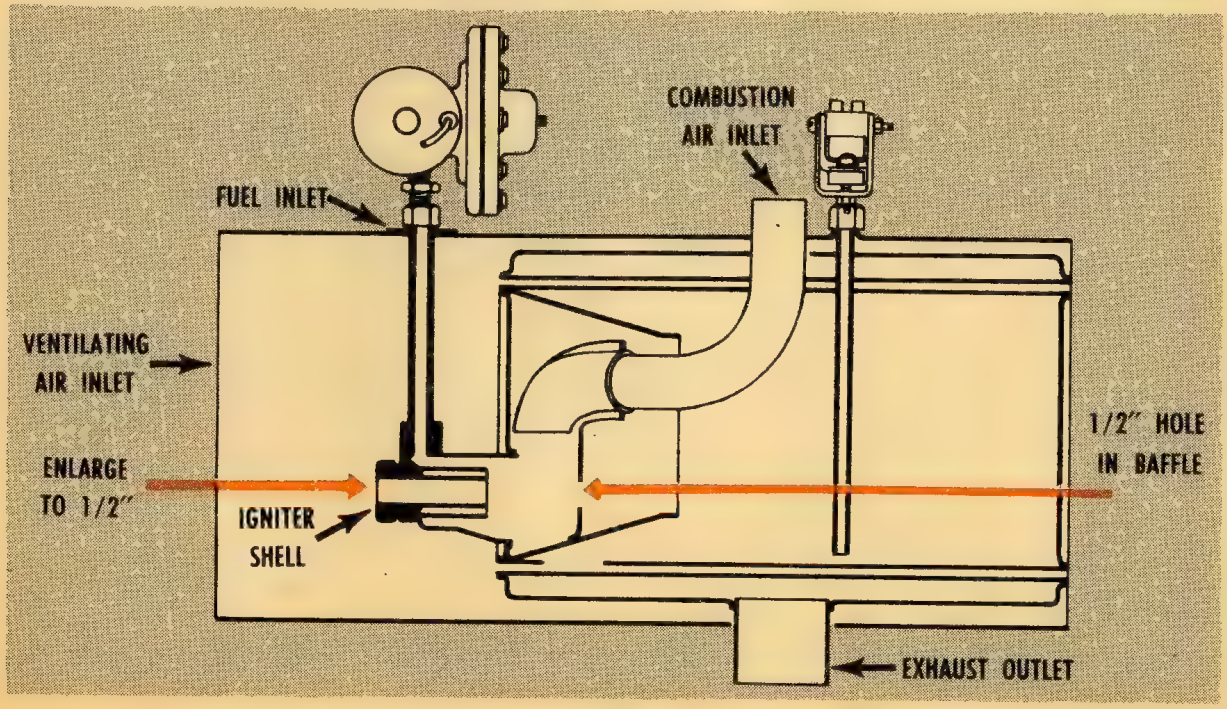
5. Remove improvised bushing guide. Insert a solid rod (about 11/16″ in diameter) through hole until it touches baffle plate, and tap the rod with a hammer until baffle is sprung inward from about 1/4″ to 3/8″ toward center of the exchanger. (A 10″ extension from a 1/2″ drive-socket set will do for the rod.)

6. To determine the correct distance to move the baffle, first insert the rod in the hole and mark it (with a colored pencil) even with the edge of the igniter well, make another mark about 3/8″ out from the first, then tap the rod with hammer until the second mark is in line with the edge of the igniter well.

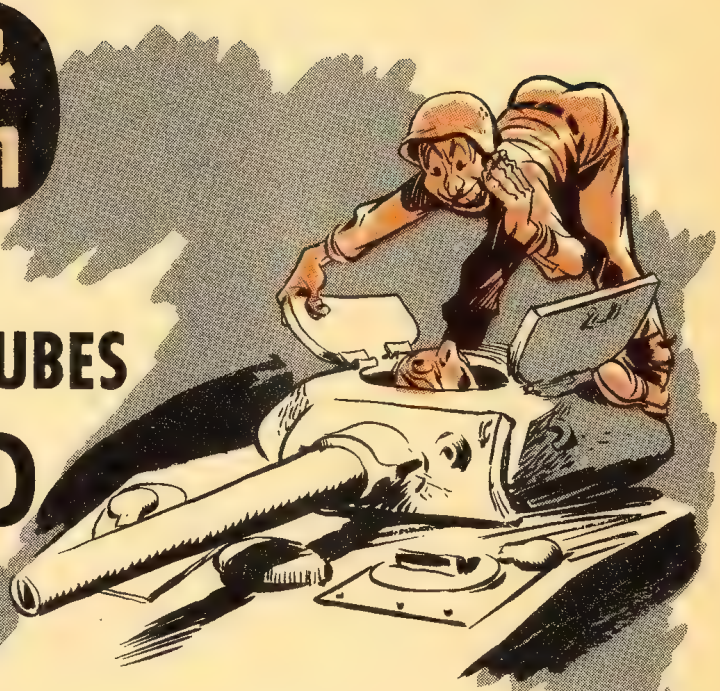
7. Reassemble heater. If it continues to operate spasmodically, the baffle may need more tapping. Some heaters suffer more baffle plate warpage than others.

The Southwind manual gives instructions on heater disassembly.

WO Mike Laputka
Alaska



ARMAMENT & AMMUNITION



M24 TANK GUN TUBES CONDEMNED

That's what is known as a scarehead. But in this case you wouldn't call it yellow. It's used in the writing trade to get special attention, and you'll be glad it got yours.

You, my friend, may be about to fire a gun that had better be left unfired. If you've got the hand that isn't reading this on the trigger of a seventy-five that lost or never had its gun book, let go quick and start reading with both hands.

1000-ROUNDS IS OUT

Gun tube life for the M24's 75mm M6 is to be measured strictly by the 1000-round limit. Only way you'll know is if its history's in the gun book. Lacking a gun book, you are to junk said gun tube without so much as an alas or alack if its piece mark begins with a capital "D".

The letter "D" means this particular tube is one of the oldies that has no known bore diameter from which your repairman can base a stargaging or pullover-gage reading. For the new-series tubes (whose piece marks start with 70391) you'll get turn-in data as soon as the firing squad tells PS what the score is.

At any rate, pay attention to that 1000-round limit. True, some of the old-series tubes went close to two-thousand rounds in destruction tests. But some few blew their stack at scarcely more than a thousand. And that's a fact . . . so keep a close score in your gun book.

In this Army, Mr. Jones, men are more important than gun tubes, and you'll be thanked for staying within your big, fat safety margin.

HOW NOT TO COOL A TORRID TUBE

You think you gotta pour ice-cold water down the red-hot tube of your 155-Howitzer? Or pick up gobs of snow and throw it all over your gun? Think three times.

It makes a nice sizzle.

Snap! Crackle! Pop!

But that's about **all** it'll do. The noise you hear is the groan of dying metal—or at least, fatigued, unhappy metal. And it can't live very long after.

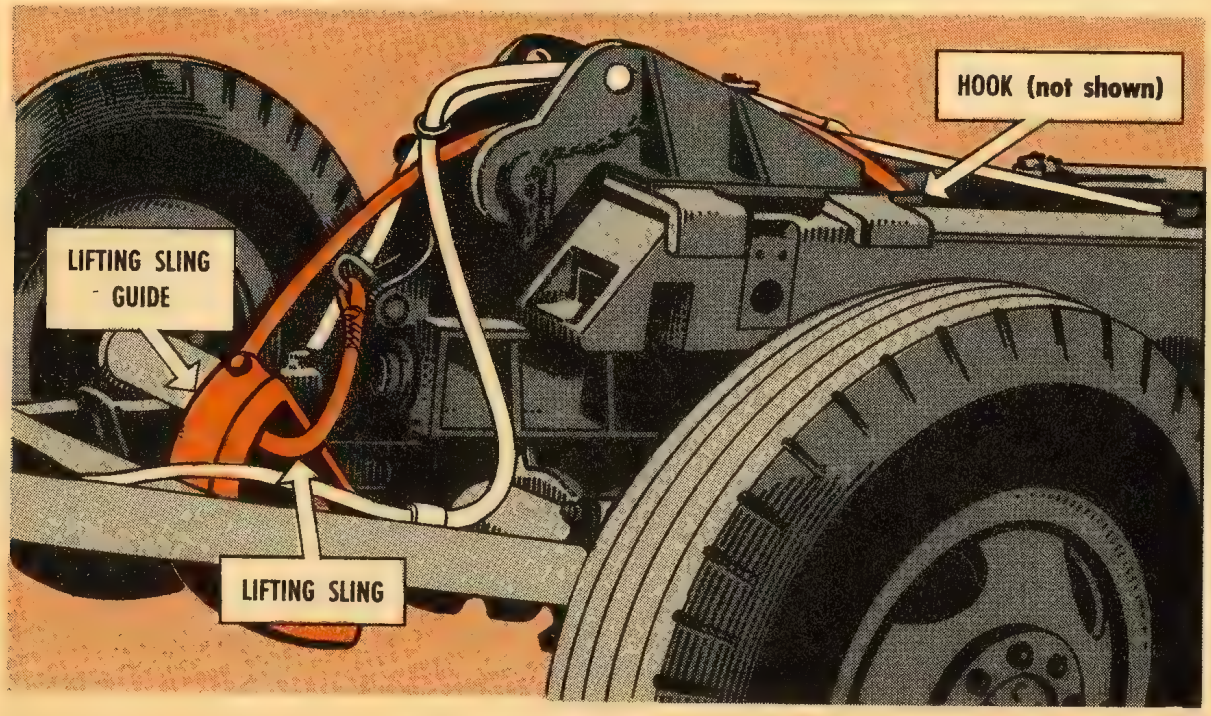
The only proper way to cool a torrid tube is just let it set awhile. Awright—when you gotta avoid a "cook-off," you swab.

But anything else...well, figure the percentages. One thing is for sure. You know how **not** to cool a torrid tube.

KINKS IN LIFTING SLINGS

Some boys in artillery organizations equipped with the 155mm Gun M2, Carriage M1 or M1A1, and the heavy-carriage limber M5, have been getting kinks in their lifting slings. This happens when the sling loop is left unrestrained, or when it's used to hold the limber tongue in a horizontal position for gun-part alinement.

There's always a right way and wrong way. The lifting sling should be looped through the lifting-sling guide (as shown in figure), and the unrestrained end attached to the hook on the trails. (See TM 9-350, p. 44.)



FIRE CONTROL

HITS WITH M71E5C SCOPE

(on the M46 tank)

When your gunner doesn't seem to be laying his shot where he's s'posed to, don't wrap the gun tube around his neck. Check his scope, he may be using the wrong one.

The M46 is equipped with a cant-correcting telescope-mount T173, which is designed to be used with telescope T152. But some gunners are using telescope M71-E5C as a substitute. This is where the trouble comes in—scope 'E5C causes shooting errors when the tank's on any kind of a slope.

If your tank has the wrong scope (M71E5C), TB 9-718-1 authorizes you to replace it with the right scope (T152). Meanwhile, if you can't get the right scope and you have to use the 'E5C, don't use the cant-correction feature. Disconnect it electrically, but leave it hooked up mechanically. This'll let the cant corrector maintain parallelism between the scope range and the gun trunnions.

When using the 'E5C, you've got to make the range-lines in the scope parallel to the gun trunnions. And since your mount doesn't have an index that will show the required parallelism, you'll have to orient the scope before doing any firing as follows:

1 Elevate gun (level ground unnecessary).

2 Place gunner's quadrant (set at zero) on breech ring across bore of tube.

3 Traverse the gun until bubble in quadrant is centered.

4 Turn the cross-leveling knob on scope holder of the mount until bubble in cross-level vial is centered. The range lines in the scope are now parallel to the gun trunnions.

5 Scribe an index line on the scope-holder assembly of the mount, either at the left or right edge of the cross-level vial-holder.

After orientation of substitute scope (M71E5C) cant correction can be made by taking lateral-aim off in the same manner used for scopes in tanks not equipped with cant-correcting mounts.

MARKING TIME

If your watch could walk on its hands, and started out from New York to the coast, it would reach Los Angeles inside of a year. A ticker ticks 432,000 times a day and its balance wheel turns about 3,558.75 miles in a year—and that's marking time. It's reason enough why a watch needs cleaning and oiling at least every twelve months.

As with any other contraption, animal or mechanical, cleanliness is important to its health—yet keeping the crystal and case clean is something most of us overlook. Those bits of wool-lint from OD's and sweaters will creep and crawl in and around even waterproof stems. And if the crystal is shaky, badly scratched or cracked, a quick change to a new one is in order.

Not that waterproof watches are always waterproof. It doesn't take long for perspiration to warp and mangle the waterproof gasket in the case. Oil or gas will also ruin the gasket, but the acid coming through a man's skin will do it most of the time.

A wrist watch should be put aside when washing—waterproof or otherwise. But if you do have to go under water with a timer, turn it in to the Ordnance repair shop as soon as possible for inspection. Those insides rust fast.

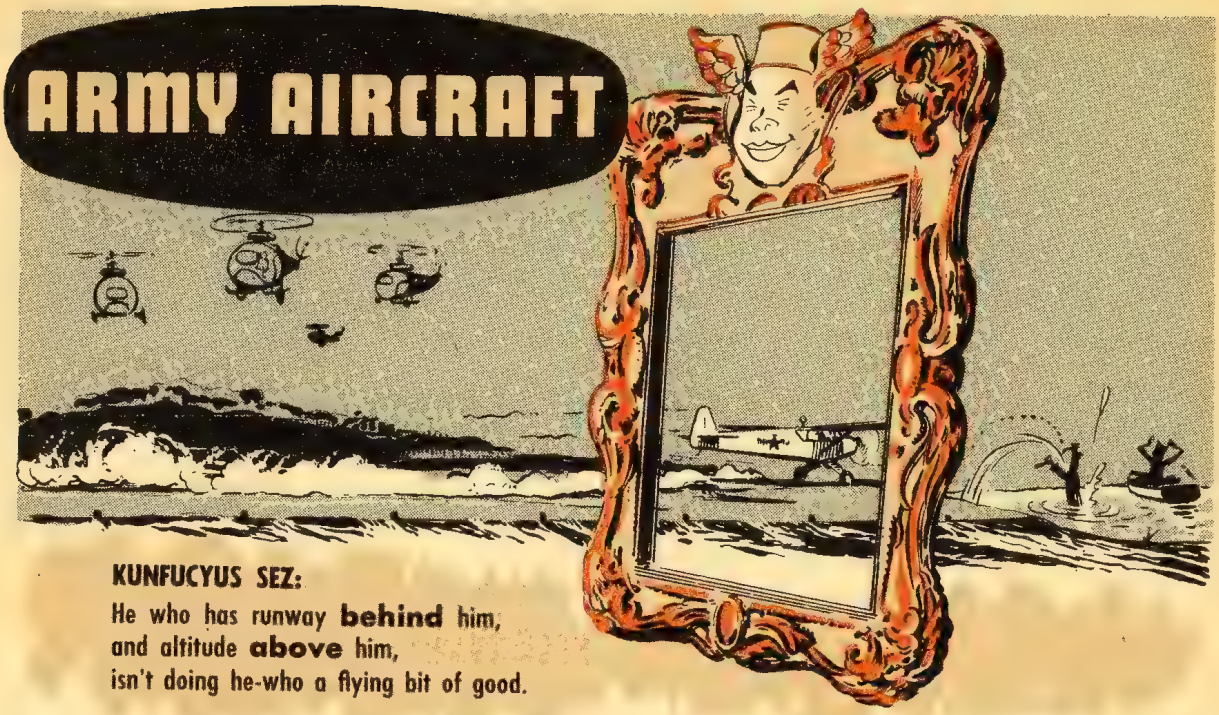
Just touching the movements can cause damage, because even fingerprints on the works can start corrosion. A watch repairman is the only one OK'd for opening the back of an issued watch.

And if you want to be popular, as well as save buying a new one, wash that strap often. The odor from a saturated band makes a soldier reek like a hog-yard.

COMPASS NEEDLE

When your compass seems to yawn in your face and move slowly, the watch-repair section has a demagnetizer that can be used to magnetize the needle and wake it up. A sluggish needle is most often caused by part of its molecular magnets getting "out of line." It takes an electric magnetizer to head the pointer in the right direction and give it the pep, vim and vigor you want.

And while we're on the subject of the needle, locking it in place when you're not using the compass will help keep it balanced for the next swing around. Leaving the needle free to sway in any direction bends more pivots than any other cause. Often it's not that the instrument is mishandled directly, but that the carrier has to jump around a bit that gives it those extra shocks. Keep the needle in shape by pressing down the locking pin when you put it away.



KEEP IT CLEAN

Windy visited around and conducted his own personal survey among the men who know their maintenance best (both Line and Field Maintenance), asking this question: What's your best suggestion for keeping aircraft and 'copters up to snuff?

They all seem to pretty well agree that the first and most important item is to keep 'em clean. Not necessarily all shiny and spotless for Saturday morning inspection, but free of dirt and leaking oil, excess grease, and so on. To use a famous old quote from the Air Force: *A clean airplane is not always well maintained, but a well maintained airplane is always clean.*

This cleanliness will pay off to you, too, since one of the best ways in the world to inspect a machine is to clean it. You can't wash the dirt off your engine and wipe it down without discovering any loose fittings or broken safety wire which may be going to give you trouble later. And it is a sure thing that in washing the grease and dust off your 'copter tail-rotor shaft-bearings and universal joint, you will detect any loose bearings.

Also, it goes without saying that your parts will last longer without a sand and oil grinding paste in the wearing parts. And who wouldn't prefer to put in half a day with solvent (see SB 38-5-3) and rags than to spend two days putting in new bearings? Take oil leaks—the sharpest way to trace down an oil leak is to start with a perfectly clean engine, and then inspect it right after running to see where it's oily.

A Tip-Trio on a Whirly-Bird

H-13 'COPTERS

TAIL-ROTOR-GUARD CLAMP

Here's a solution to the interference between the tail-rotor-gear-housing lubrication-plug and the upper tail-rotor-guard-clamp, which has gone to AMC for adoption.

You loosen the tail-boom clamps and remove the bolt that holds the guard into the clamp sleeve. Then shift the clamp sleeve about 30° to starboard (away from the lube plug), tighten, and drill a new hole in the guard tube, using the holes in the sleeve as your guide. Replace the bolt, and that's all—much easier than trying to relocate the lube plug, particularly on the late models with the large spotface.

Now is an excellent time to insert a doubler tube, about a foot long, into the top of the guard tube. The guard retaining-bolt will hold it, and it will spread the strain and help prevent vibration breaks where the guard tube goes into the clamp sleeve.

H-13 TACHS

Seems that being just a little too heavy on the screw that clamps your engine tach-generator on the Franklin engine in Bell 'Copters can set up enough distortion so the generator can't turn. Unfortunately, the gear on the engine crankshaft seems to be softer than the gear on the tach generator, so you come up against an engine change. The best suggestion made so far was to take the adapter off the engine, assemble the tach generator until it is tight in its mounting threads but the clamp is not so tight that the generator armature won't turn freely. Read the torque setting (it will vary between components) and then replace the assembly on the aircraft using the same torque setting. If the engine is out of the aircraft, it is possible to assemble the adapter to the tach generator and install them as one unit.

Mag Check figures for this Franklin are 2700-rpm with an allowable drop of 200-rpm. Power check is at 3000.

BELL ROTORHEAD ALINEMENT

If you wish you could check your blade sweep in the field, without taking the rotorhead off the helicopter, relax—you can. Take an extra Zerk fitting (1/8" to fit the gimball-ring bearings) and drill a small hole through it. Thread your chalk line through the fitting and knot the end to retain it. This gimmick can be screwed into the gimball ring in place of the existing fitting and will give you a pretty accurate center spot. Use your blade jaw-marks and the blade alinement-pin the same as always, and be careful to be straight above the string when sighting the inboard blade jaw-mark.

MORE AND MORE ON THE L-19A

Windy stormed around, here and there in the ZI, and landed back home with his pockets full. Full of juicy notes on aircraft, that is. He wanted to write a book, but then decided you'd rather have the info now—page by page. Ready?

CYLINDER FAILURE

Watch the enamel on the lower fins of your 470-11 engines, particularly on the front cylinders. If you detect a crazing or cracking, send it in for a jug pull and piston check. Piston failures on this engine will often announce themselves thusly before doing serious harm. **Caution:** Do not fly a ship with signs of excessive heating on these fins.

STARTER DRAIN

There have been some cases of hydraulic lock in the starters on the 470-11 engines, resulting from leakage in the oil seal between the crankcase and the starter casting. Windy was shown a drain tube that's being installed on the school ships at Fort Sill to cure this trouble practically painlessly.

All they do is remove the threaded plug at the bottom of the starter casting and install tube fittings. Then, either drill and tap the oil-filler-neck casting for a fitting, or silver solder one into the steel-tube neck itself. Connecting the fittings with a 1/4″ copper tube carries off any oil leakage without dirtying up the aircraft's underbelly.

TAIL-WHEEL BRACKETS

It can be said again and again: Keep a careful eye on the tail-wheel brackets on your L-19A's, particularly those with the old bracket. You are looking for cracks at the rear end, under the spring. The new and longer brackets are said to hold up better, and not to crack the fuselage metal as often.

OIL-FILLER-CAP LOCK

The Fort Sill boys have evolved a lock which will keep your L-19A oil-filler caps in place pending development of a modified cap.

They remove the filler-neck assembly and braze a small hex nut to the side of the neck—positioned so it's right under the outer ear on the filler cap when the cap is on

tight (Fig. 1). One of the nut's flat surfaces goes against the neck, the hole running up and down. Then, by drilling a hole in the ear of the cap, a steel pin can be dropped down through both cap and nut to prevent accidental turning of the cap in flight (Fig. 2).

At Sill, they make the pin from some #9 wire or 1/8″ welding rod, form a ring in the upper end by which it can be handled and also fasten it to the filler neck by a short length of light chain. Since the records show that loss of this cap in flight has resulted in loss of oil and engine failure, Windy suggests that this fix is cheap insurance.

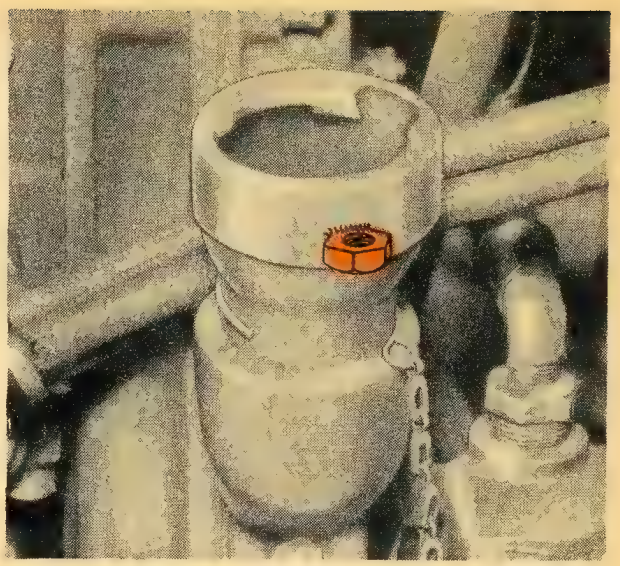


Fig. 1—To keep oil-filler caps secure, braze a 3/32″ hex nut to oil-filler neck.

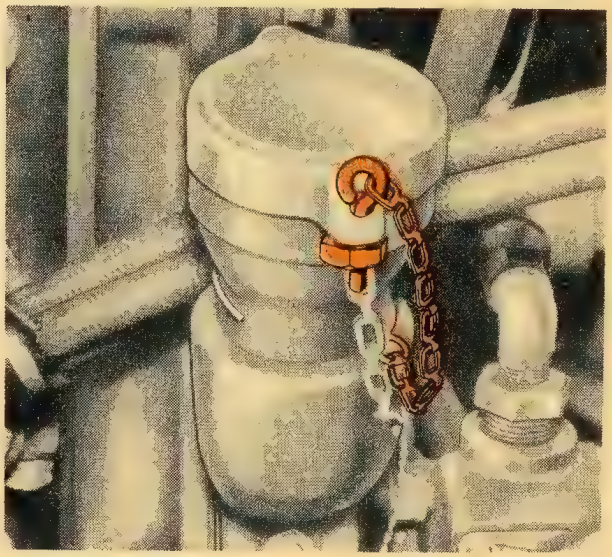


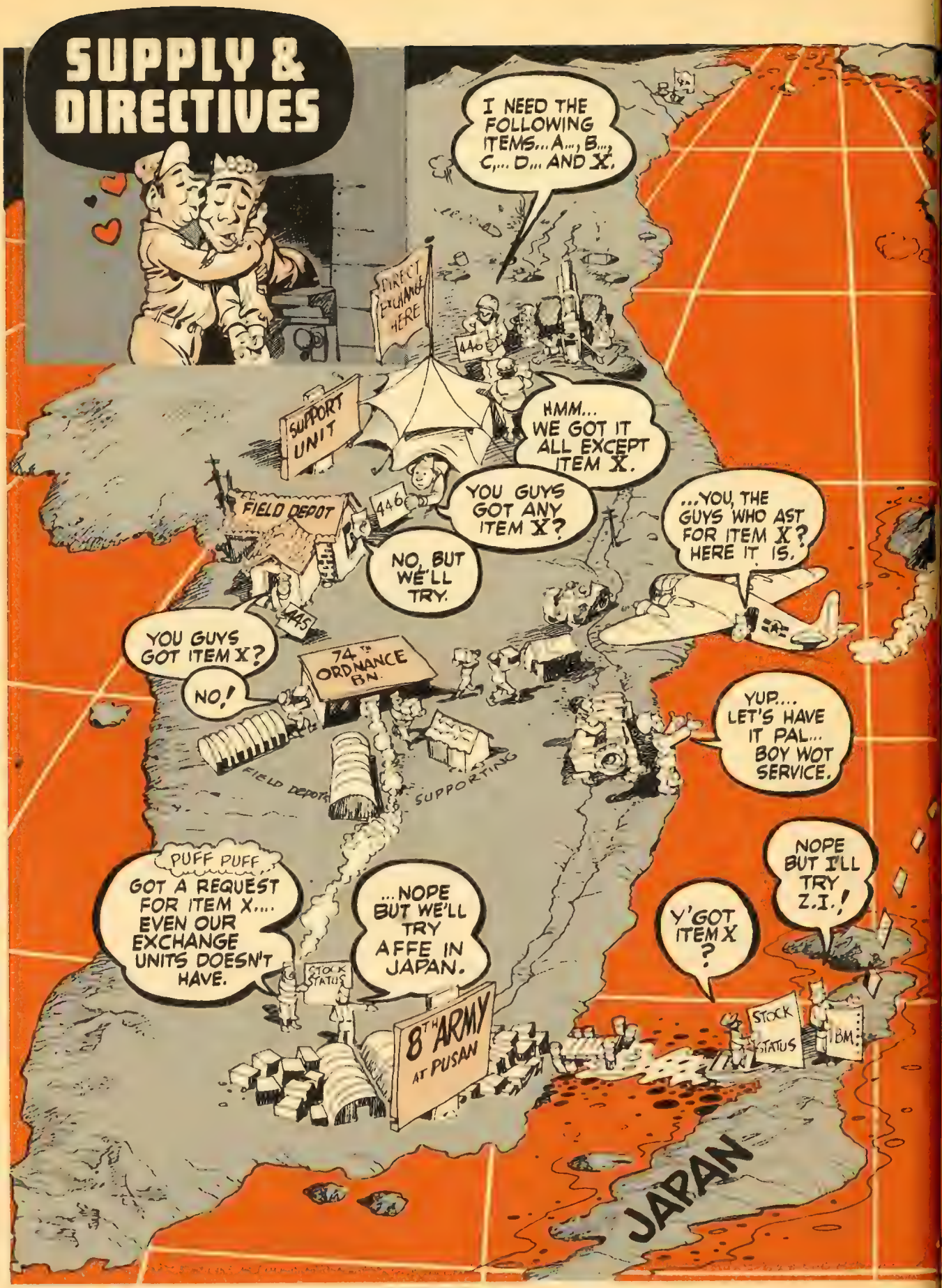
Fig. 2—Drill hole in ear of the cap to fit hole of nut, and drop in a steel pin.

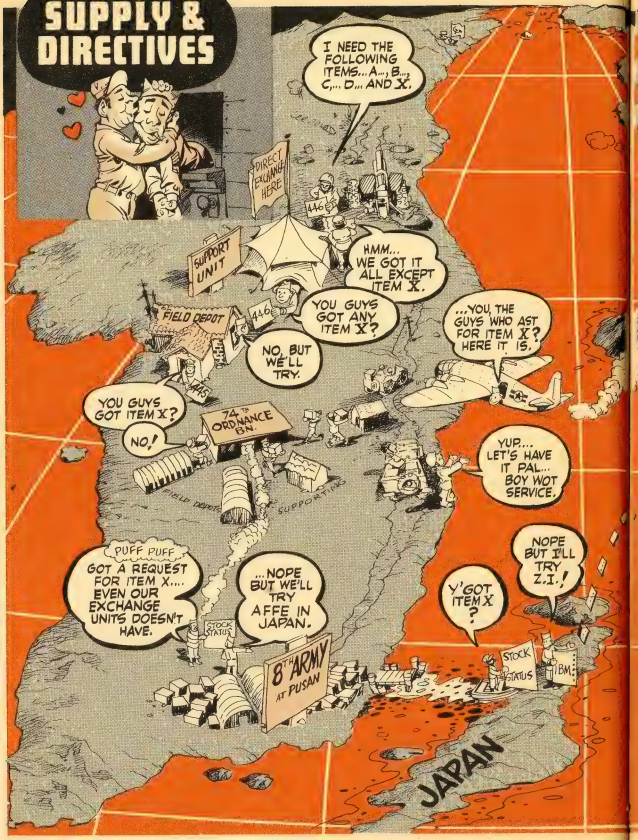
EXHAUST STACK CLAMPS

These same boys at Sill showed Windy how they were rotating the center expansion-joint-clamp on the 470-11 engine exhaust manifold about 45° to prevent the hot gas which escapes at that point from striking the intake tube. It was suggested that heating this tube might have contributed to some of the piston failures in Number Two cylinder. In any case, moving the clamp around a bit prevents burnt paint, dirty stacks and coking on the inside of the intake tube. A quick look at your engine will show how this can be done—and you might better check all the clamps to be sure they are not letting hot gas shoot onto your ignition cables, either.

RADIO TROUBLES?

If the radio goes out in your L-19A, before you call the Commo boys, take a quick look at the mike-button-circuit-jack at the bottom of your forward stick. Sometimes this will work itself part way out and snaff the radio system. There is no law which says you can't safety it in place with a bit of wire.


SUPPLY & DIRECTIVES
I NEED THE FOLLOWING ITEMS... A..., B..., C,... D... AND X.
DIRECT EXCHANGE HERE
446
SUPPORT UNIT
HMM... WE GOT IT ALL EXCEPT ITEM X.
FIELD DEPOT
446
YOU GUYS GOT ANY ITEM X?
NO, BUT WE'LL TRY.
...YOU, THE GUYS WHO AST FOR ITEM X? HERE IT IS.
445
YOU GUYS GOT ITEM X?
NO!
74TH ORDNANCE B.N.
FIELD DEPOTS
SUPPORTING
YUP... LET'S HAVE IT PAL... BOY WOT SERVICE.
PUFF PUFF
GOT A REQUEST FOR ITEM X.... EVEN OUR EXCHANGE UNITS DOESN'T HAVE.
...NOPE BUT WE'LL TRY AFFE IN JAPAN.
NOPE BUT I'LL TRY Z.I.!
Y'GOT ITEM X ?
STOCK STATUS
STOCK STATUS
IBM
8TH ARMY AT PUSAN
JAPAN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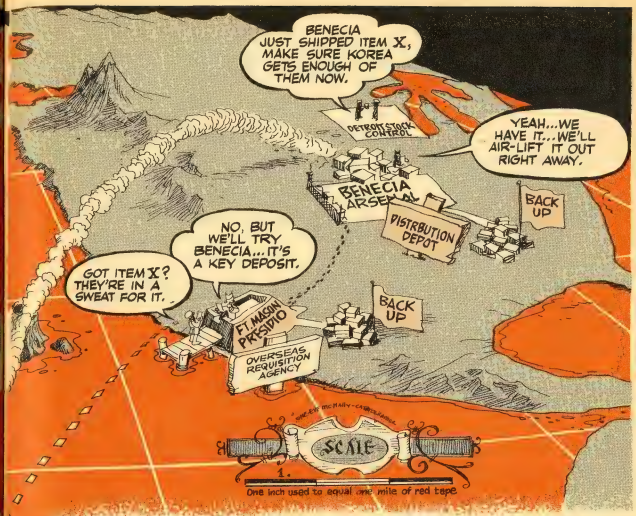

BENECIA JUST SHIPPED ITEM X, MAKE SURE KOREA GETS ENOUGH OF THEM NOW.
DETROIT STOCK CONTROL
YEAH... WE HAVE IT... WE'LL AIR-LIFT IT OUT RIGHT AWAY.
BENECIA ARSENAL
DISTRIBUTION DEPOT
BACK UP
NO, BUT WE'LL TRY BENECIA... IT'S A KEY DEPOSIT.
GOT ITEM X? THEY'RE IN A SWEAT FOR IT.
FT. MASON PRESIDIO
OVERSEAS REQUISITION AGENCY
BACK UP
SCALE
1.
One inch used to equal one mile of red tape

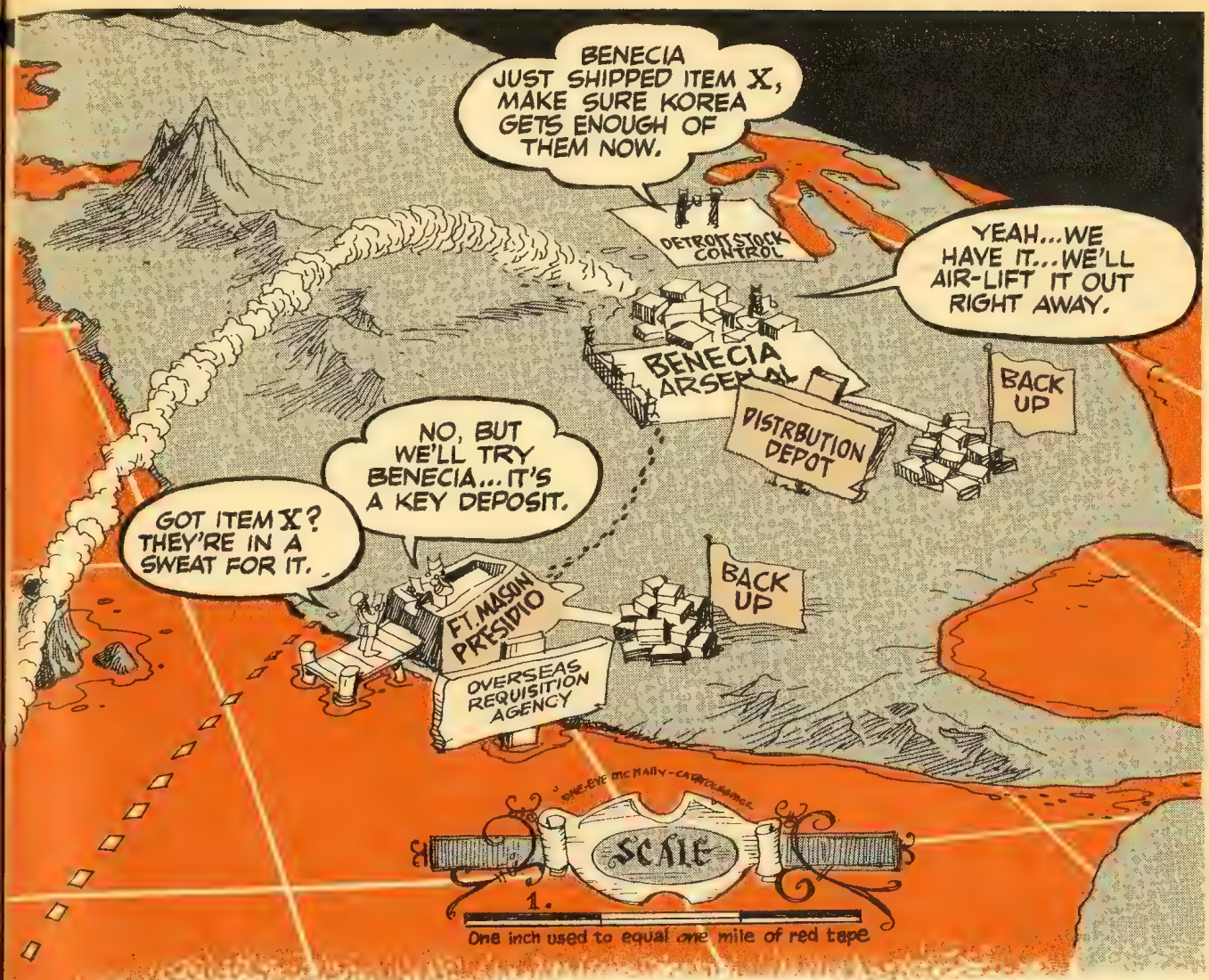
SWANSONG OF THE SHORTAGE BLUES

Here's your first picture of the brand new system for keeping the right amount of the right spare parts in the right place at the right time, and when you need 'em.

The system's already in effect, it's working, and the first of a batch of directives to tell you what's what, is SR 780-30-5.

First thing done was to separate the "retail" from the "wholesale" and clearly label them. The seven distribution depots are strictly in the retail business. They'll distribute and stock in their back-up depots large quantities of the things you need most often. Smaller amounts of slower moving things will be kept separate from fast moving items. That's all those seven depots have to do, so they can give their full time to the job of keeping you supplied.

If your distribution depot does happen to be "sold out" of any of the items on your requisition, they'll extract to the key depot and that'll be the end of the trip for your requisition. And you'll be kept posted about the goings on so you'll know what to expect. The key depots have their back-ups, and behind all the others there's a stock control point so if the key depot and its storage back-up don't have the parts you want, stock control moves to fill the gap.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24/6-VOLT CONVERSION KITS

Pull all those nails out of your battery posts and send the kids out to play in the streets again. The fastest requisition is your ticket to bright lights and the music of squealing brakes on your towed artillery.

Enough fanfare, boys. Stop jumping up and down. You can now busy yourself with wiring these small packages of safety onto the nearest cannon wagon.

Walk down to that comely supply clerk, who will now begin to look good to you, and with PS in your hand (in case he isn't sure what you're after) sound off like the true Jodie and sing him the stock number that fits you best. The fine selection is listed below.

You'll find a lovely set of instructions in each package and if you're not entirely satisfied, tear off a piece of the box top and get double or nothing.

Whatever other zany thing you do, you needn't waste your time or mine, taking off any wiring or fixtures that are already on the tractor or trailer. On with the new and take off with the old trailer.

Your caissons will then not only roll, they'll even stop.

1 For gun, 40mm, M1, w/cge, M2A1
Kit, Stock No. AO50-7356683(S)

Consists of:

a. Resistor box w/blackout switch
b. Warner electric brake plugs
c. Scintilla plug or equivalent
d. Necessary cable, 5 and 7 wires
e. Scintilla carrying case

2 For gun, 90mm, AA, w/mt, M2
Kit, Stock No. DO38-7356684(S)

Consists of:

a. Resistor box w/blackout switch
b. Warner electric brake plugs
c. Scintilla plug or equivalent
d. Scintilla carrying case
e. Necessary cable, 5 and 7 wires
f. Warner electric brake female plugs and covers, or equivalent

3 For gun, 90mm, AA, w/mt, M1A1
Kit, Stock No. DO28-7356685(S)

Consists of:

a. Resistor box w/blackout switch
b. Warner electric brake plugs
c. Scintilla plug or equivalent
d. Scintilla carrying case
e. Necessary cable, 5 and 7 wires

f. Warner electric brake female plugs and covers, or equivalent

4 For gun, 120mm, M1, w/mt
Kit, Stock No. DO32-7356686(S)

Consists of:

a. Resistor box w/blackout switch
b. Warner electric brake plugs
c. Scintilla plug or equivalent
d. Scintilla carrying case
e. Necessary cable, 5 and 7 wires
f. Warner electric brake female plugs and covers, or equivalent

5 For wagon, cannon transport M1A1 and M2A1
Kit, ORD No. 7356687*

Consists of:

a. Resistor box
b. Scintilla plug or equivalent
c. Warner electric brake plugs, male, female, and split female
d. Necessary cable, 5 wires

6 For trailer, 2-ton, 4wh, generator, M7 and M18; director, M13 and M14; and semitrailer, 5-ton, 2wh, refrigerator van.
Kit, Stock No. G577-7366755(S)

Consists of:

a. Resistor box
b. Scintilla plug or equivalent
c. Scintilla carrying case
d. Necessary cable, 5 and 7 wires

7 For trailer, 4-ton, 2wh, ammunition, M21
Kit, ORD No. 7356754*

Consists of:

a. Resistor box
b. Scintilla plug or equivalent
c. Scintilla carrying case
d. Necessary cable, 5 and 7 wires

8 For trailer, 8-ton, 4wh, ammunition, M23
Kit, ORD No. 7356756*

Consists of:

a. Resistor box
b. Scintilla plug or equivalent
c. Scintilla carrying case
d. Necessary cable, 5 and 7 wires
e. Scintilla female plug

9 For trailer, fuel servicing, 2wh, 600 gal.
Kit, ORD No. 7356757*

Consists of:

a. Completely new 24-volt system, including lights

10 For howitzer, 240mm: howitzer, 75mm, pack; gun, 90mm, T8; howitzer, 105mm, MA2A1; howitzer, 155mm; gun, 155mm; howitzer, 8 inch;
Adapter, Stock No. CO21-7356624

Consists of:

a. Plug w/internal resistors (coupled between 6-volt cable plug on artillery and 24-volt receptacle on prime mover).

***Note:** These kits had no stock numbers when PS went to press. If you need 'em bad, try your requisition with the Ordnance numbers.

ELECTRIC-BRAKE-CONTROL KITS, WATERPROOF, 24-Volt

1. For 2-1/2-ton, 6x6, M34 truck:
Kit, ORD No. 7358559 (G742-5701553)

2. For 2-1/2-ton, 6x6, M135 truck:
Kit, ORD No. 7358560

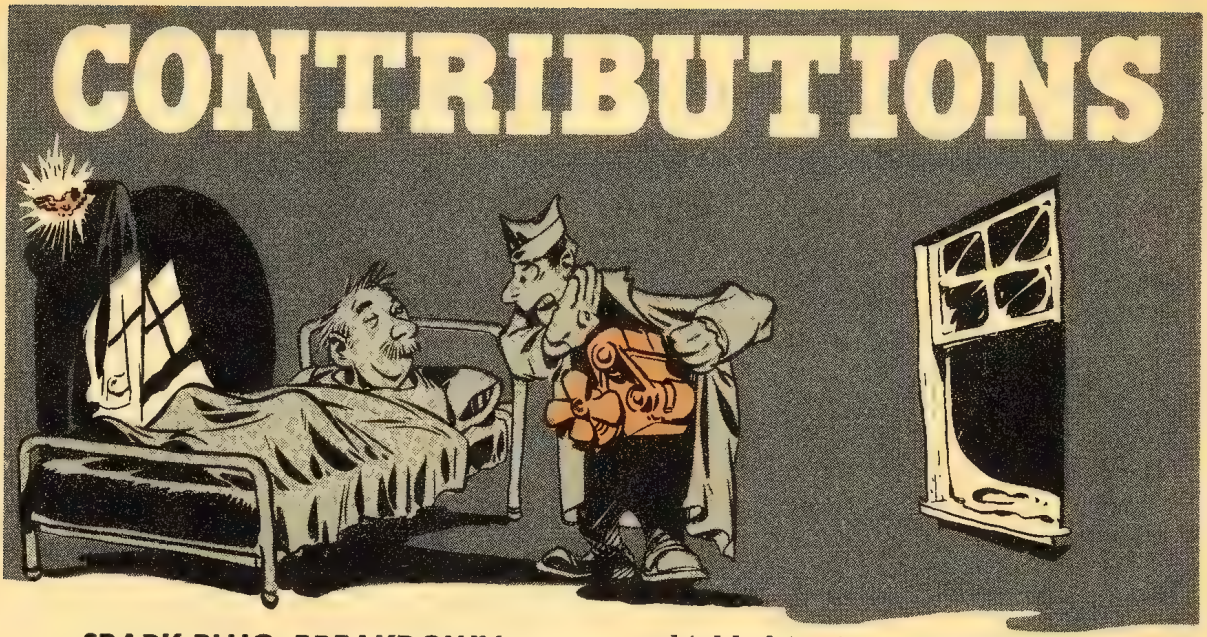
3. For 5-ton, 6x6, M52 truck:
Kit, ORD No. 8347015

4. For 5-ton, 6x6, M41 truck:
Kit, ORD No. 8347016

All consist of hand control for cab to apply electric brakes of towed vehicles.

Note: The kits had no stock numbers when PS went to press. Try your requisition with the Ordnance numbers—or, as a last resort, a little extra cable will let you use the M34's kit on the other trucks.

CONTRIBUTIONS



SPARK-PLUG BREAKDOWN

Dear Editor,

In regard to spark-plug breakdown, as discussed in PS #6, I've found that the spark plug is at fault. The plug when checked has spark, yet the resistor in the spark plug can't take the cylinder pressure. I've checked this by running the engine at least five minutes and then touching each plug. Nine times out of ten there is one plug that is cold compared to the other three. If this test fails, then I start from number one cylinder and try a new plug in each cylinder until the skip or breakdown in the engine is cured.

PFC Robert Casalinuovo
APO 112, New York

(Ed Note—You are very nearly right. The failure of some of the waterproof spark-plugs is due to the carbon resistors inside them. However, it is the heat, not the cylinder pressure which causes them to break down. Your suggestion for finding the missing plug in a shielded ignition system is as good as any we have heard yet. When you have the adapter set, 17-A-3150, it has an adapter that lets you get at the wire inside the harness for checking plugs, but even then, it would save a lot of time to use your test first. If you check out all the plugs and find the engine still misses, try replacing the high-tension wires on the missing plugs. Some ignition harnesses may have shorted.

SPLITTING TRAIL SPADES

Dear Editor,

To overcome the problem of splitting trail spades during cold weather operations with the 155-Howitzers, our outfit used logs and railroad ties with sandbag backing. When we had to blast to soften the ground, we used the supplementary charge from the projectile, which is discarded when using the VT fuse. Not too noisy and just enough of a charge to do the trick.

W/O Louis Fillicelli
Korea

VALVE-ADJUSTING-SCREW TOOL

Dear Editor,

Here's a home-made adapter that saves much trouble when removing and installing valve adjusting-screws from valve tappets in L and F-head engines like the M38 and M38A1 (Fig. 1).

You can make it by putting a 5/16" x 1/2" Phillips screw into the square hole of a 3/8" square-drive socket-wrench, and fastening them together with a 5/16" lock washer and nut. Be sure the socket-wrench fits the valve adjusting-screw.

To use the tool, you first remove the valve, valve spring, spring seat, and spring seat-pin. Then place the adapter over the valve adjusting-screw with the Phillips screw-head facing the valve guide. Insert a Phillips screwdriver through the valve guide, grip the tappet with a tappet wrench, and take the adjusting-screw out by unscrewing the adapter. Install it the same way Fig. 2).

Ralph Talles
OTAC—Detroit

BROKEN SAFETY-PLUNGERS

Dear Editor,

In PS #8 you mentioned that when firing a Howitzer, a good way to smash the safety plunger was to insert the firing mechanism partway with the breech open, then slam the breech closed. We found that out, here in Korea, but it took a little time.

For a while safety plungers were breaking like crazy, three or four a week. It got so bad we had to have one Ordnance machine shop given over entirely to making new ones.

Then we discovered that some of the boys were being careless about inserting the firing mechanism, screwing it

Fig. 1—Remove valve, valve spring, and seat to fit adapter on adjusting-screw.

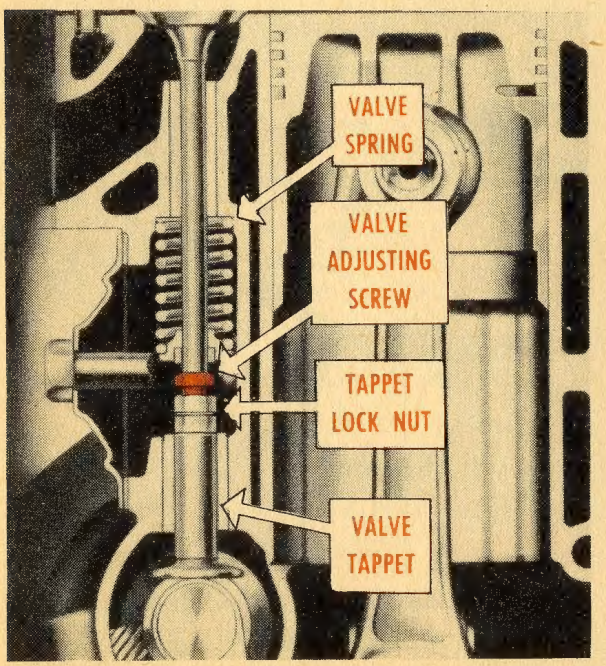
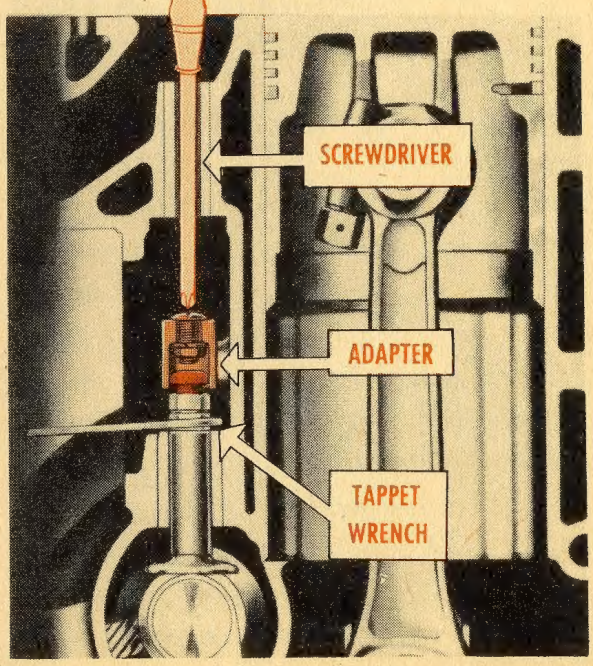


Fig. 2—Hold tappet with wrench and unscrew adapter to remove adjusting-screw.



only half-way in before closing the breech. After they were set right on that score, we soon found that we had a surplus of safety plungers.

SFC Rulon Stephenson
Korea

A HOLE IN THE HEAD?

Dear Editor,

In manufacture of the 1/4-ton trucks (Willys and Ford) why didn't they adopt a slotted-head bolt for the left side of the fuel-pump assembly? Then a common heavy-duty screwdriver could be used when removing or replacing the fuel-pump assembly. In most cases, a mechanic uses a 3/8" drive-socket-wrench—but a socket-wrench set isn't always available in the field, so he has an awkward, time-wasting job on his hands.

Cutting a slot in the head of the left bolt (large enough to take a heavy-duty screwdriver) would save time and work when the job is done in the field.

SFC Carl W. Bergstedt
APO 9, San Francisco

(Ed Note—Your idea is OK—as a field expedient—for World War II 1/4-ton trucks. In addition to speeding up the ticklish job of running the bolt in and out, the slotted-head bolt and screwdriver trick will keep knuckles from getting burned and skinned. But a screwdriver might not apply enough torque to get the bolt as tight as it needs to be—especially if new washers aren't used. So, for other than a field expedient, use a wrench of some kind to take care of the final tightening.

On the M38 and M38A1 the problem was eliminated with the addition of "bolt extensions" on both of these fuel-pump mounting screws. (see TM 9-804, page 112, Fig. 29), and on the M38A1 there's an extension on the front mounting-screws (see TM 9-804A, page 145, Fig. 50).

GRAB A HANDLE

Dear Editor,

The running boards on the M135 are so high from the ground that you need a hand-hold to pull yourself up into the cab. Most guys grab the cab top-cover lashing-ropes to pull themselves up, which plays the devil with the rope and tarp. To make it easy on yourself, ropes, and tarps, rig a handle (Fig 3) and fasten it to the cab with the two bolts you'll find already there.

Mr. Allen Wright
Fort Leonard Wood, Missouri

(Ed Note—Yes indeed. And on the right side of the cab, a handle will keep you from grabbing hold of a hot exhaust stack to pull yourself up.)

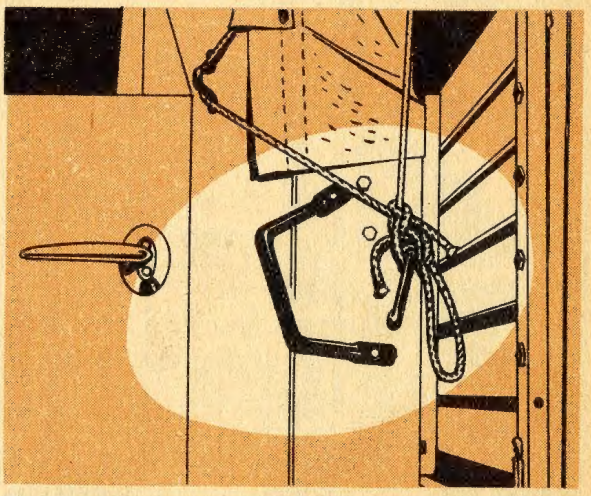


Fig. 3—Let the tarp and rope alone, and use a handle to boost yourself into the cab.

Connie Rodd's BRIEFS

Another drain plug

It's the 5-ton jobs this time—the flywheel-housing drain-plugs should be left out of all the new 5-ton series trucks when they're on dry land. Like on all the other interim vehicles the plug is only to be used when fording. This'll keep you from getting oil in the clutch compartment and save your clutches.

Grease in hub cavities

In case this news hasn't already caught up with you, it's now SOP to lube hub cavities level-full with grease on all wheeled vehicles. This is after you've packed the bearing cone assemblies.

Change in cooling system care

When you're thumbing thru TM 9-2858 for dope on cooling systems, make sure your cooling system manual has its latest change—it's Change 1, 26 Sept 52, and has to do with preventive cleaning. The Change isn't listed in SR 310-20-4, but you can get it from your publications section.

Cold weather warm-up

Now that old man winter's breathing thru your M46 tank deck-grills and making engine starting and warm-up tough —get hold of MWO ORD G244-W13 (4 Nov 52). It tells how to get fixed-up for improved warm-up in cold weather.

Cold weather dope

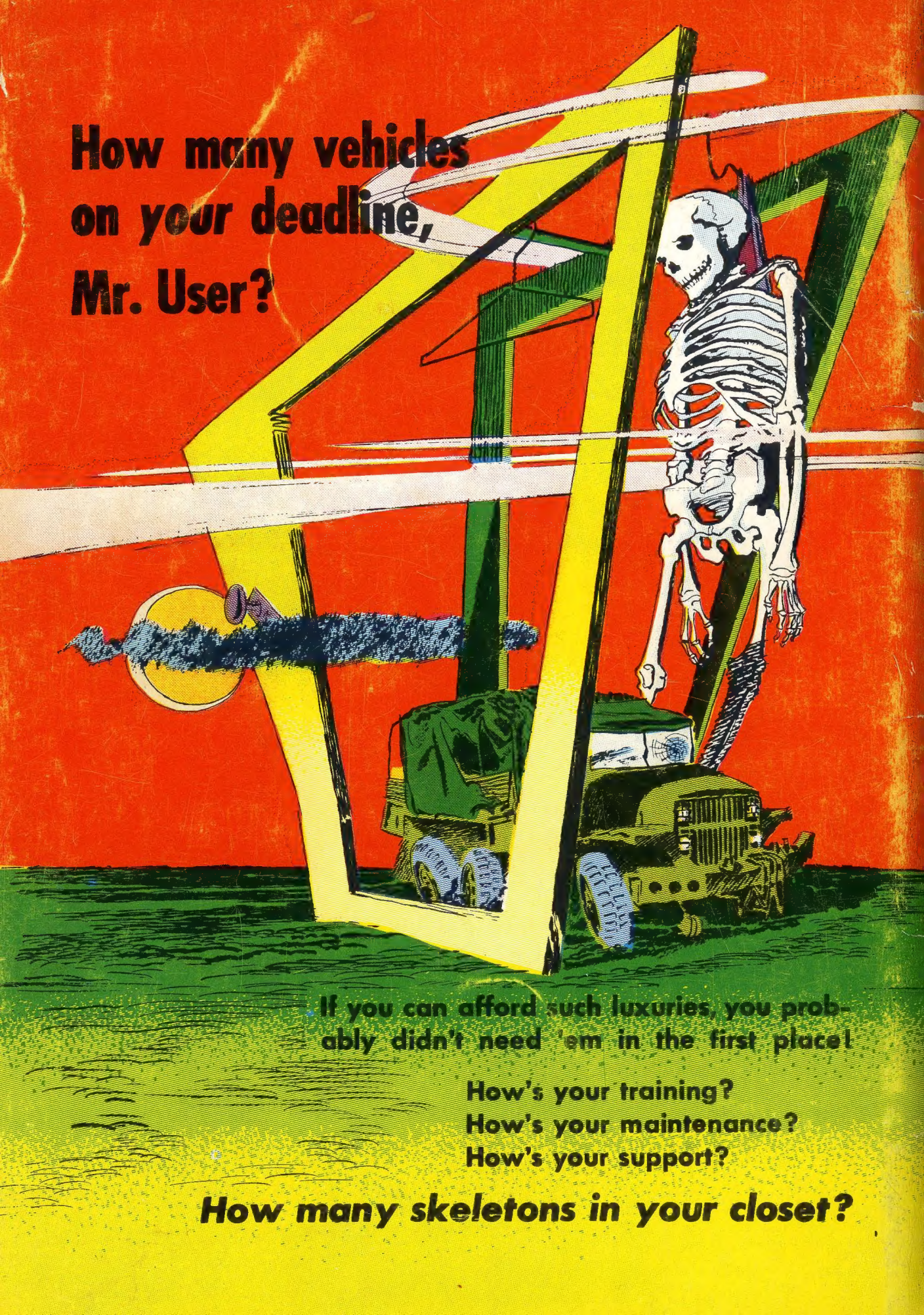
For those interested in info about keeping things humming in freezing weather . . . FM 70-15 (Operations in Snow and Extreme Cold) was superseded by FM's 31-70, 31-71, and 31-72.

Special lubes

No matter what anybody tells you about lubricants for commercial type vehicles, TB 378 dated 17 October 1951 is still the Pentagon authority for what to oil them with.

Torque readings

You'll get accurate torque-wrench readings only from free-running, lubricated threads. If threads are gummed, buggered, or rusted, your reading can be as much as 100% wrong—and usually is. Clean 'em, oil 'em.


How many vehicles on your deadline, Mr. User?
If you can afford such luxuries, you probably didn't need 'em in the first place!
How's your training?
How's your maintenance?
How's your support?
How many skeletons in your closet?